

The free-living fresh- and brackish-water Copepods of Belgium

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Summary

The chronologic development of the knowledge of the Copepoda from Belgian continental waters is outlined. The faunal list now stands at 71 species and subspecies. Three among these appear to be endemic. The number of Calanoids might well be definitive, but there is ample room for additions in the Cyclopoids and Harpacticoids.

Key-words : Copepods, inland waters, Belgium.

Samenvatting

De chronologische ontwikkeling van de kennis van de Copepoda uit de Belgische continentale waters wordt geschetst. Thans zijn 71 soorten en ondersoorten gekend, waarvan er drie voorlopig endemisch lijken. De lijst van de Calanoida is wellicht definitief; bij de Cyclopoida en Harpacticoida kunnen nog aanvullingen verwacht worden.

Trefwoorden : Copepoden, binnenwateren, België.

Introduction

In drawing up the present list of Copepod species reported from Belgium, all truly freshwater species were taken into account, as well as those species occurring in mesohaline and even marine environments but which regularly penetrate oligohaline waters. As a consequence, the first record for some species was from saline environments (e.g. *Eurytemora velox*), while this species is really almost a freshwater form.

The history of copepod research in Belgium is now about 120 years old, and begins with a paper by Felix Plateau (1870), professor of zoology at the University of Gent, in which three species are listed, all of which were perhaps misidentified, but all of which really occur in Belgium. Today, the list stands at 71 species and subspecies (Table 1), a quite reasonable number, and which may represent as much as 80% of the ultimate total.

Check-list (Table 1)

Discussion

In PLATEAU's (1870) paper, only one cyclopoid species, presumably *Cyclops strenuus*, one harpacticoid, pre-

sumably *Canthocamptus staphylinus*, and one calanoid, presumably *Diaptomus castor*, are mentioned. A second list of fresh- and brackish water copepods from Belgium is found in LAMEERE's Faune de Belgique of 1895. It comprises 6 cyclopoids, among which *Ectocyclops phaleratus* (not listed by LINDBERG, 1950) is of uncertain origin, beside PLATEAU's calanoid and harpacticoid species. The first usable information on Copepods appears in a paper by LOPPENS (1908), on the plankton of a brackish-water in the Yzer river-catchment. It includes the ubiquitous cyclopoid, *Acanthocyclops vernalis*, beside two *Eurytemora* species among the Calanoids, and brings the total number of species to eleven. Remarkably, the next important leap forwards was derived from a study of the cavernicolous fauna of Belgium in a series of papers by R. LERUTH (1933, 1934, 1935- and especially the monumental monograph LERUTH, 1939, published shortly before the untimely death of this author in the first days of world war II). LERUTH submitted much of his material, collected in various caves and springs, to specialists abroad. Thus, Copepods were studied by F. KIEFER (1936) and P.A. CHAPPUIS (1933, 1937), and led to the description of one new subspecies of Cyclopoid and one new species of Harpacticoid. In all, 8 Cyclopoid and 6 Harpacticoid species and subspecies were listed. KIEFER (1935) independently recorded two *Halicyclops* species from saline environments. These are, however, included here because they penetrate to oligohaline waters.

The next increase in numbers occurred by the publication of a short paper by LINDBERG (1950), primarily aimed at attracting attention to the deficient level of knowledge on the Cyclopoids from France, but listing at the same time, all species known from Germany, Switzerland, the Netherlands, and Belgium. In preparing his manuscript, LINDBERG contacted A. CAPART of the Institute of Natural Sciences, Brussels, who made available a considerable number of unpublished identifications, all listed as "CAPART, 1949" in the 1950 paper. Twelve species were thus added to the Belgian fauna.

In a series of monographs published by the Institute of Natural Sciences in Brussels, LELOUP and co-workers (LEFEVERE, LELOUP & VAN MEEL, 1956, LELOUP et al. 1954 ; LELOUP & JACQUEMART, 1963 ; LELOUP & KONIETZKO, 1956 ; JACQUEMART & LELOUP 1956, 1958a, 1958b) recorded copepods from the various biotopes studied. They were identified by the German expert H.V. HERBST, and led to another series of additions : *Attheyella trispinosa*, *Megacyclops latipes*, *Diacyclops bisetosus*, *Eurytemora velox*, *Eudiaptomus vulgaris*, and *E. gracilis*. POLK's (1963) work on the harpacticoids of the Sluice-dock, in the harbour complex of Ostend, resulted in the discovery of three harpacticoid species (*Canuella perplexa*, *Nitocra typica*, and *Mesochra lilljeborgi*) which may be considered as part of the inland water fauna as well. DE PAUW (1969) found *Microarthridion littorale*, a species falling into the same category in the same harbour, six years later. The acceleration of studies during the 1960ies is further exemplified by studies by DUMONT (1965, 1966), and VERRAES (1965), increasing the faunal list by another thirteen species. From the "Dievangat", a mesohaline pond in the Zwin area, Heip (1969) reported the species *Tachidius discipes* and *Paronychocamptus nanus*, along

with the brackish water cyclopoid *Halicyclops magniceps*, while DUSSART (1969), in his "Faune des Copépodes" cites *Paracyclops fimbriatus chiltoni* from fish ponds at Mirwart. The latest series of additions were DUMONT (1972), involving two cyclopoids, a harpacticoid, and a calanoid. One of the cyclopoids, *Metacyclops problematicus*, was a species new to science, formally described in DUMONT (1974). It occurred in the river Sambre, downstreams of Charleroi, i.e. in the worst polluted part of the River. DE HENAU (1980) later recorded the species in the river Leie at Gent, at its junction with the Watersportbaan. The background of this strange habitat selection is believed to be competitive exclusion from healthy biotopes, and not a preference for polluted waters *per se*.

The latest single addition, finally, was again a harpacticoid (*Phyllognatopus viguieri*) (VAN DE VELDE, 1974) which, like *Attheyella wulmeri* (DUMONT, 1972), is a groundwater species. While the probability of finding many more species in the surface waters of Belgium now appears rather small, it is quite likely that many species still await discovery in interstitial water of river gravels, and in the groundwater proper.

Table 1.

SPECIES NAME

FIRST REFERENCE AND/OR KEY REFERENCE

Calanoida

1. *Eurytemora affinis* (POPPE, 1880)
2. *Eurytemora lacustris* (POPPE, 1887)
3. *Eurytemora velox* (LILLJEBORG, 1853)
4. *Diaptomus castor* (JURINE, 1820)
5. *Eudiaptomus vulgaris* (SCHMEIL, 1896)
6. *Eudiaptomus gracilis* (SARS, 1863)
7. *Eudiaptomus graciloides* (LILLJEBORG)

- LOPPENS, 1908 ; DE PAUW, 1969
 LOPPENS, 1908 ; DE PAUW, 1969
 LEFEVERE et al. 1956 ; DUMONT & GYSELS, 1971
 PLATEAU, 1870 ; LAMEERE, 1895
 H. HERBST, in LELOUP, et al 1954 ; SORGELOOS, 1970
 H. HERBST, in JACQUEMART & LELOUP, 1958
 DUMONT, 1972

Cyclopöida

8. *Halicyclops magniceps* (LILLJEBORG, 1853)
9. *Halicyclops neglectus* KIEFER, 1935
10. *Halicyclops septentrionalis* (KIEFER, 1935)
11. *Macrocyclus fuscus* (JURINE, 1820)
12. *Macrocyclus albidus* (JURINE, 1820)
13. *Macrocyclus distinctus* (RICHARD, 1887)
14. *Eucyclus serrulatus* (FISCHER, 1851)
15. *Eucyclus speratus* (LILLJEBORG, 1901)
16. *Eucyclus macruroides* (LILLJEBORG, 1901)
17. *Eucyclus denticulatus* (GRAETER 1903)
18. *Eucyclus macrurus* (SARS, 1863)
19. *Tropocyclus prasinus* (FISCHER, 1860)
20. *Paracyclops* f. *fimbriatus* (FISCHER, 1853)
21. *Paracyclops fimbriatus chiltoni* (THOMSON, 1882)
22. *Paracyclops poppei* (REHBERG, 1880)
23. *Paracyclops affinis* (SARS, 1863)
24. *Ectocyclus phaleratus* (KOCH, 1838)

- HEIP, 1969
 KIEFER, 1935
 KIEFER, 1935
 LAMEERE, 1895
 LAMEERE, 1895
 CAPART, 1949 in LINDBERG, 1950
 LAMEERE, 1895
 CAPART, 1949 in LINDBERG, 1950
 CAPART, 1949 in LINDBERG, 1950
 DUMONT, 1965
 CAPART, 1949 in LINDBERG, 1950
 DUMONT, 1965
 LERUTH, 1934
 DUSSART, 1968
 DUMONT, 1965
 CAPART, 1949, in LINDBERG, 1950
 LAMEERE, 1895 (sub. *C. canthocarpoïdes*)

25. *Cyclops abyssorum* SARS, 1863 (1)
 26. *Cyclops strenuus* FISCHER, 1851 (1)
 27. *Cyclops insignis* CLAUS, 1857 (2)
 28. *Cyclops* v. *vicinus* OULJANINE, 1875
 29. *Megacyclops viridis* (JURINE, 1820)
 30. *Megacyclops latipes* (LOWNDES, 1927)
 31. *Megacyclops gigas* (CLAUS, 1857)
 32. *Acanthocyclops vernalis* (FISCHER, 1853)
 33. *Acanthocyclops robustus* (SARS, 1863)
 34. *Acanthocyclops venustus* (NORMAN & SCOTT, 1906)
 35. *Acanthocyclops sensitivus* (GRAETER & CHAPPUIS, 1914)
 36. *Diacyclops bicuspidatus* (CLAUS, 1857)
 37. *Diacyclops bisetosus* (REHBERG, 1880)
 38. *Diacyclops l. languidus* (SARS, 1863)
 39. *Diacyclops l. belgicus* KIEFER, 1936
 40. *Diacyclops languidoides clandestinus* (KIEFER, 1926)
 41. *Microcyclops rubellus* (LILLJEBORG, 1901)
 42. *Cryptocyclops bicolor* (SARS, 1863)
 43. *Metacyclops gracilis* (LILLJEBORG, 1853)
 44. *Metacyclops problematicus* DUMONT, 1972
 45. *Mesocyclops leuckarti* (CLAUS, 1857)
 46. *Thermocyclops oithonoides* (SARS, 1863)
 47. *Thermocyclops crassus* (FISCHER, 1853)
 48. *Thermocyclops dybowskii* (LANDE, 1890)
 49. *Graeteriella unisetigera* (GRAETER, 1908)

- H. HERBST, in LELOUP & KONIETZKO, 1956
 PLATEAU, 1870 (sub. *C. quadricornis*)
 CAPART 1949, in LINDBERG 1950
 CAPART 1949, in LINDBERG 1950
 LAMEERE, 1895
 HERBST, 1958 in JACQUEMART & LELOUP, 1958
 HERBST, 1954 in LELOUP et al., 1954
 LOPPENS, 1908
 CAPART, 1949, in LINDBERG 1950
 KIEFER, 1936
 KIEFER, 1936
 CAPART 1949 in LINDBERG 1950
 HERBST 1958, in JACQUEMART & LELOUP 1958
 CAPART 1949, in LINDBERG 1950
 KIEFER, 1936
 LERUTH, 1934
 DUMONT, 1972
 DUMONT, 1965
 DUMONT, 1965
 DUMONT, 1972, 1974
 CAPART, 1949 in LINDBERG 1950
 CAPART, 1949 in LINDBERG 1950
 DUMONT, 1965
 DUMONT, 1966
 LERUTH, 1934

Harpacticoida

50. *Canuella perplexa* (T. & A. SCOTT, 1893)
 51. *Phyllognathopus viguieri* (MAUPAS, 1892)
 52. *Tachidius discipes* GIESBRECHT, 1882
 53. *Microarthridion littorale* (POPPE, 1881)
 54. *Nitocra lacustris* (SCHMANKEVITSCH, 1875)
 55. *Nitocra hibernica* (BRADY, 1880)
 56. *Nitocra typica* BOECK, 1864
 57. *Nitocra spinipes* BOECK, 1864
 58. *Canthocamptus staphylinus* (JURINE, 1820)
 59. *Mesochra lilljeborgi* BOECK, 1864
 60. *Attheyella crassa* (SARS, 1863)
 61. *Attheyella trispinosa* (BRADY, 1880)
 62. *Attheyella wulmeri* (DE KERHERVE, 1914)
 63. *Moraria varica* (GRAETER, 1911)
 64. *Bryocamptus minutus* (CLAUS, 1863)
 65. *Bryocamptus praegeri* (SCOURFIELD, 1912)
 66. *Bryocamptus pygmaeus* (SARS, 1863)
 67. *Bryocamptus typhlops* (MRAZEK, 1893)
 68. *Bryocamptus zschokkei* (SCHMEIL, 1893)
 69. *Elaphoidella leruthi* (CHAPPUIS, 1939)
 70. *Paronychocamptus nanus* (SARS, 1908)
 71. *Onychocamptus mohammed* (BLANCHARD & RICHARD, 1891)

- POLK, 1963
 VAN DE VELDE, 1974
 HEIP, 1969
 DE PAUW, 1969
 VERRAES, 1965
 DUMONT, 1965
 POLK, 1963
 VERRAES, 1965
 PLATEAU, 1870
 POLK, 1963
 CHAPPUIS, 1933 ; LERUTH, 1934
 H. HERBST, in LELOUP et al., 1954
 DUMONT, 1972
 CHAPPUIS, 1933 ; LERUTH, 1934, 1939
 VERRAES, 1965
 CHAPPUIS, 1933 ; LERUTH, 1934, 1939
 VERRAES, 1965
 CHAPPUIS, 1933 ; LERUTH, 1934, 1939
 CHAPPUIS, 1933 ; LERUTH, 1934, 1939
 CHAPPUIS, 1937
 HEIP, 1969
 VERRAES, 1965.

¹ There are numerous subspecies of both taxa in Europe. The subspecies of *C. strenuus* found in the littoral of Lake Donk is close to *C. strenuus strenuus*, but the Belgian subspecies of *C. abyssorum* remains to be studied.

² There are no published locality records for CAPART's species, but all were subsequently confirmed as present in Belgium. The rare *C. insignis* lives in Lake Donk ; some material was sent by me to U. EINSLE, who reports on it in EINSLE (1975) but misplaces Lake Donk (in Eastern Flanders, not in Holland).

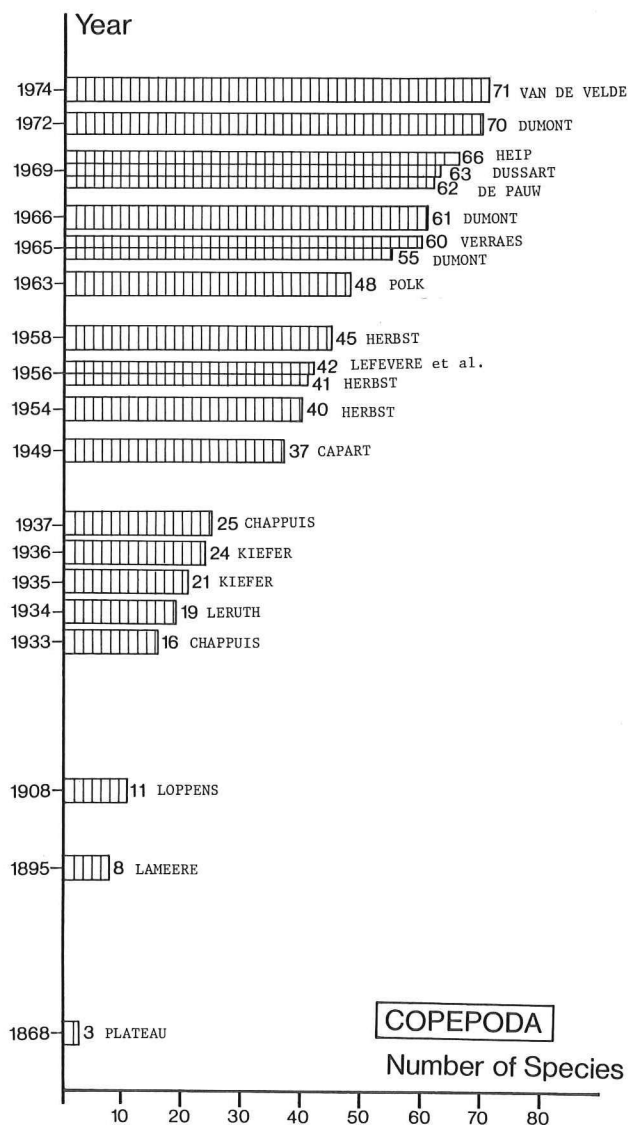


Fig. 1 : An overview of the historical development of the faunistic knowledge on the fresh- and brackish water copepods of Belgium. With each bar, author(s) and total number of species on record at that point in time are indicated.

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