

Contribution
to the macroinvertebrate fauna of the Hungarian Danube.
VII. Isopods (Crustacea: Malacostraca: Isopoda)

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ABSTRACT: In this part of the series the records of aquatic isopods in the collection of the Danube Research Institute (former Hungarian Danube Research Station) are presented. Two species (*Asellus aquaticus* and *Jaera sarsi*) have been identified in 379 samples collected between 1994–2009 at 195 sites of the Hungarian Danube section (main channel, side branches, and adjacent wetlands).

Introduction, materials and methods

To date, three epigeal aquatic isopod species have been reported from Hungary. *Asellus aquaticus* (Linnaeus, 1758) and *Jaera sarsi* Valkanov, 1936 are common and widespread, whilst *Proasellus pribenicensis* Flasarová, 1977 occurs only in the North-Eastern region of the country (KONTSCHÁN 2001). A fourth species, *Jaera danubica* Brtek, 2003 has been described from the nearby Slovakian section of the River Danube (BRTEK 2003); however, as pointed out by BORZA (2012), this form cannot be regarded as a valid species.

Within the macroinvertebrate collection of the Danube Research Institute 379 samples from 195 locations along the Hungarian Danube section contained isopods. The ‘List of species’ section of the paper contains the code of the sampling site, code of the method, date of collection (year-month-day), and monograms of collectors (in parentheses), respectively. The detailed description of the material and methods can be found in NOSEK (2007). The animals were identified following GRUNER (1965/66).

Results

Two species have been identified in the material; *Asellus aquaticus* was found in 209 samples (133 sites), whilst *Jaera sarsi* occurred in 194 samples (81 sites). They showed conspicuously different habitat preferences; *A. aquaticus* occurred mostly in stagnant waters of wetlands (Szigetköz, Gemenc, and Béda-Karapanca), and in the slow-flowing, regulated Ráckevei-Soroksári Danube-arm, whereas *J. sarsi* was found almost exclusively at eupotamic sites (main arm, Szentendrei-arm, Mosoni-arm). Co-occurrence was detected only at 16 sites (ADO1, DRE2, DUF4, DUH1, ERC1, GON2, LIP3, LIP4, MMO1, NOC1, RAC1, SCH2, VEN1, VEN3, ZAT1, ZAT4). On 3 sites (CSA1, CSA4, ZAT3) *J. sarsi* replaced *A. aquaticus* during the study period.

List of species

Asellus aquaticus (Linnaeus, 1758) – ADO1-HD: 2001.05.22. (BE, CsG, NJ, ON) – ARA1-K: 2003.07.24. (ME, NJ) – ARA3-K: 2003.05.30. (AS, BG, CsZ, NJ) – ASV5-K: 2003.05.29. (AS, BG, CsZ, NJ) – BAD1-K: 2004.08.27. (ME, NJ); 2005.07.21. (ME, NJ) – BAD2-K: 2004.08.27. (ME, NJ) – BAG1-D: 2003.07.26. (ME, NJ) – BAG3-K: 2004.07.26. (ME, NJ) – BDH1-K: 2004.08.28. (ME, NJ); 2004.09.28. (BG, CsZ, NJ, ON) – BDH2-K: 2004.09.28. (BG, CsZ, NJ, ON) – BDH3-K: 2004.08.28. (ME, NJ) – BEB1-K: 2004.08.28. (ME, NJ); 2004.09.28. (BG, CsZ, NJ, ON) – BEB3-K: 2004.09.28. (BG, CsZ, NJ, ON) – BEK1-C: 2004.08.28. (ME, NJ) – BFD1-K: 2004.08.26. (ME, NJ) – BFD2-K: 2005.07.21. (ME, NJ) – BOD1-K: 2003.05.29. (AS, BG, CsZ, NJ) – BOK1-K: 2004.08.28. (ME, NJ); 2004.09.28. (BG, CsZ, NJ, ON) – BTH1-K: 2004.09.30. (BG, CsZ, NJ, ON) – BTH2-K: 2005.06.16. (BG, CsZ, NJ, ON, VT) – BTH3-K: 1999.06.24. (NJ, ON) – BTH6-K: 1999.06.24. (NJ, ON) – CIK2-K: 1998.09.01. (NJ); 1999.07.13. (NJ); 2001.07.02. (NJ); 2003.05.29. (AS, BG, CsZ, NJ) – CSA1-C: 1996.06.20. (NJ) – CSA4-K: 1996.06.20. (NJ) – CSD1-K: 2005.06.13. (BG, CsZ, NJ, ON, VT); 2005.07.19. (ME, NJ) – CSD2-K: 2004.08.25. (ME, NJ) – CSD3-K: 2000.07.14. (CsG, NJ, ON) – CSD6-K: 1999.06.25. (NJ, ON) – CSO2-K: 2004.09.15. (NJ) – CSP1-K: 2005.09.14. (NJ, ON) – DFC1-K: 2004.09.29. (BG, CsZ, NJ, ON) – DKD1-K: 2005.06.14. (BG, CsZ, NJ, ON, VT) – DKD2-K: 2005.07.20. (ME, NJ) – DKD3-K: 1999.06.23. (NJ, ON) – DKD8-K: 1999.06.23. (NJ, ON) – DND1-K: 2005.06.14. (BG, CsZ, NJ, ON, VT) – DND5-K: 2005.06.15. (BG, CsZ, NJ, ON, VT) – DOM1-K: 2005.06.23. (NJ, ON) – DRE2-C: 1999.06.08. (NJ) – DRE2-C: 1999.08.31. (NJ) – DSB2-K: 2004.07.26. (ME, NJ) – DSM1-K: 2004.07.26. (ME, NJ) – DSM2-K: 2004.07.26. (ME, NJ) – DUF4-C: 1998.04.20. (NJ); 1998.09.01. (NJ); 1999.10.27. (NJ); 2002.06.11. (NJ); 2002.09.17. (NJ) – DUF7-K: 2003.07.25. (ME, NJ) – DUH1-HD: 2001.05.23. (BE, CsG, NJ, ON) – DUH2-K: 2005.09.14. (NJ, ON) – DUH3-K: 2005.09.14. (NJ, ON) – DUH4-K: 2005.09.14. (NJ, ON) – DUH5-D: 2005.09.14. (NJ, ON) – ERC1-H: 1998.06.11. (CsG, NJ, ON) – ERC1-HD: 2001.05.22. (BE, CsG, NJ, ON) – ERT2-K: 2004.09.29. (BG, CsZ, NJ, ON) – FEC2-K: 2004.08.26. (ME, NJ); 2005.07.21. (ME, NJ) – FEC3-K: 2005.07.22. (ME, NJ) – FEK2-K: 2003.05.28. (AS, BG, CsZ, NJ, VT) – FUZ1-K: 2004.08.27. (ME, NJ) – FUZ2-K: 2004.08.27. (ME, NJ) – GON2-HD: 2001.05.08. (BE, CsG, NJ, ON) – HED1-K: 2004.07.26. (ME, NJ) – HRZ1-K: 2005.06.15. (BG, CsZ, NJ, ON, VT) – HSI1-K: 2004.09.27. (BG, CsZ, NJ, ON) – HSI2-K: 2004.09.27. (BG, CsZ, NJ, ON) – HTV1-K: 2004.07.25. (ME, NJ) – KAC1-K: 2004.07.26. (ME, NJ) – KAD1-K: 2005.07.22. (ME, NJ) – KAD2-K: 2005.07.22. (ME, NJ) – KED1-K: 2005.06.16. (BG, CsZ, NJ, ON, VT) – KFC1-K: 2004.08.27. (ME, NJ) – KFC2-K: 2004.09.29. (BG, CsZ, NJ, ON) – KFC3-K: 2004.08.27. (ME, NJ) – KFC4-K: 2004.09.29. (BG, CsZ, NJ, ON) – KFC5-K: 2004.08.27. (ME, NJ) – KKL1-K: 2005.06.23. (NJ, ON); 2005.09.14. (NJ, ON) – KML3-K: 2003.07.24. (ME, NJ) – KPD1-K: 2004.08.25. (ME, NJ) – KRC1-K: 2005.07.21. (ME, NJ) – KRC2-K: 2004.08.27. (ME, NJ) – KRC3-K: 2005.07.21. (ME, NJ) – LIP2-K: 2003.05.29. (AS, BG, CsZ, NJ) – LIP3-K: 1995.07.11. (NJ); 1995.09.13. (NJ); 1996.06.20. (NJ); 1996.09.18. (NJ); 1998.06.22. (NJ); 1998.09.01. (NJ); 1999.07.14. (NJ); 1999.10.28. (NJ); 2001.07.02. (NJ); 2002.07.09. (NJ); 2002.10.08. (NJ); 2003.05.29. (AS, BG, CsZ, NJ); 2004.07.25. (ME, NJ); 2008.09.25. (NJ, ME) – LIP4-D: 2003.05.29. (AS, BG, CsZ, NJ) – LIP4-K: 2003.05.29. (AS, BG, CsZ, NJ); 2003.07.24. (ME, NJ); 2004.07.25. (ME, NJ); 2008.07.17. (NJ, ME); 2008.09.25. (NJ, ME) – MAK1-K: 2005.06.23. (NJ, ON); 2005.09.15. (ON) – MAK2-K: 2005.06.23. (NJ, ON) – MAT1-D: 2005.06.15. (BG, CsZ, NJ, ON, VT) – MAT1-K: 2005.06.15. (BG, CsZ, NJ, ON, VT) – MMO1-D: 2003.05.28. (AS, BG, CsZ, NJ, VT) – MMO1-K: 2003.05.28. (AS, BG, CsZ, NJ, VT) – MOD1-K: 2004.09.29. (BG, CsZ, NJ, ON) – MOH1-HD: 2001.05.22. (BE, CsG, NJ, ON) – NOC1-K: 2003.07.24. (ME, NJ) – NOC3-K: 2003.07.24. (ME, NJ); 2003.09.10. (BG, CsZ, NJ, ON) – NTO1-K: 2004.09.28. (BG, CsZ, NJ, ON) – NYD1-K: 2005.06.14. (BG, CsZ, NJ, ON, VT) – NYD3-K: 1999.06.24. (NJ, ON) – NYD4-K: 1999.06.24. (NJ, ON) – RAC1-HD: 2001.05.23. (BE, CsG, NJ, ON) – RAC2-K: 2005.06.23. (NJ, ON) – RAC4-K: 2005.06.23. (NJ, ON) – RIH3-K: 2004.09.29. (BG, CsZ, NJ, ON) – SAF1-K: 2005.06.13. (BG, CsZ, NJ, ON, VT) – SCH2-K: 1997.07.28. (NJ); 1998.06.22. (NJ); 1998.10.14. (NJ); 2002.06.11. (NJ); 2002.07.09. (NJ); 2002.09.17. (NJ); 2002.10.07. (NJ) – SCH3-K: 2003.05.27. (AS, BG, CsZ, NJ, VT); 2003.09.09. (BG, CsZ, NJ, ON); 2004.09.15. (NJ) – SCH5-K: 2004.09.15. (NJ) – SMA1-K: 2005.06.23. (NJ, ON) – SMA2-K: 2005.09.14. (NJ, ON) – SMI1-K: 2005.09.14. (NJ, ON) – SMI2-K: 2005.09.14. (NJ, ON) – SMI3-K: 2005.06.22. (NJ, ON); 2005.09.14. (NJ, ON) – SOR1-D: 2005.09.14. (NJ, ON) – SOR1-K: 2005.09.14. (NJ, ON) – SOR2-D: 2005.09.14. (NJ, ON) – SOR2-K: 2005.09.14. (NJ, ON) – SUF1-K: 2005.06.13. (BG, CsZ, NJ, ON, VT) – SUF4-K: 2005.07.19. (ME, NJ) – SUG1-K: 2005.06.16. (BG, CsZ, NJ, ON, VT) – SUG2-K: 2004.08.29. (ME, NJ) – SUG3-K: 2004.08.29. (ME, NJ) – SVC1-K: 2004.07.25. (ME, NJ) – SZB2-K: 2005.06.23. (NJ, ON) – SZB3-K: 2005.06.23. (NJ, ON) – SZC1-D: 2003.07.22. (ME, NJ); 2003.09.10. (BG, CsZ, NJ, ON) – SZC1-K: 2003.07.22. (ME, NJ); 2003.09.10. (BG, CsZ, NJ, ON) – TAS2-D: 2005.09.15. (ON) – TAS2-H: 2001.05.23. (BE, CsG, NJ, ON) – TAS2-K: 2005.06.23. (NJ, ON); 2005.09.15. (ON) –

TKD1-K: 2005.06.15. (BG, CsZ, NJ, ON, VT) – VAJ2-K: 2000.07.12. (CsG) – VAJ4-K: 2000.07.12. (CsG) – VAJ5-K: 2000.07.12. (CsG) – VAJ7-K: 2005.06.16. (BG, CsZ, NJ, ON, VT) – VEN1-DC: 2001.05.07. (BE, CsG, NJ, ON) – VEN3-K: 2002.09.23. (NJ, ON) – ZAT1-D: 2003.07.23. (ME, NJ) – ZAT2-C: 1994.05.17. (NJ); 1996.07.30. (NJ); 1999.10.27. (NJ) – ZAT3-K: 1996.06.20. (NJ); 1996.07.30. (NJ); 1996.09.17. (NJ) – ZAT4-K: 1994.07.18. (NJ); 1996.06.20. (NJ); 1996.09.17. (NJ); 1997.07.28. (NJ); 1998.09.01. (NJ); 1998.10.14. (NJ); 1999.06.08. (NJ); 1999.07.13. (NJ); 1999.10.27. (NJ); 2001.07.02. (NJ); 2001.10.09. (NJ); 2002.07.09. (NJ); 2002.10.07. (NJ); 2003.05.27. (AS, BG, CsZ, NJ, VT); 2003.07.26. (ME, NJ); 2004.07.23. (ME, NJ) – ZAT7-K: 2003.09.09. (BG, CsZ, NJ, ON) – ZAT9-K: 2003.07.24. (ME, NJ); 2003.09.12. (BG, CsZ, NJ, ON) – ZSC1-K: 2003.07.24. (ME, NJ) – ZSC2-K: 2004.07.26. (ME, NJ)

Jaera sarsi Valkanov, 1936 – ADO1-HD: 2001.05.22. (BE, CsG, NJ, ON) – ALF1-H: 2002.07.02. (AS, BG, NJ, VT); 2003.05.14. (ME, NJ) – ALM1-H: 2003.05.14. (ME, NJ) – ASV2-C: 2002.07.09. (NJ); 2002.09.17. (NJ) – BOD2-K: 2002.09.17. (NJ) – CIK1-D: 2004.07.23. (ME, NJ) – CIK3-C: 2003.07.26. (ME, NJ) – CSA1-C: 2003.07.25. (ME, NJ); 2004.07.23. (ME, NJ); 2008.09.24. (NJ, ME) – CSA2-CK: 1998.09.01. (NJ); 1999.07.13. (NJ); 1999.10.27. (NJ); 2002.07.09. (NJ); 2002.09.17. (NJ); 2003.05.26. (AS, BG, CsZ, NJ, VT); 2008.07.16. (NJ, ME) – CSA4-K: 2003.07.25. (ME, NJ); 2004.07.23. (ME, NJ); 2008.09.24. (NJ, ME) – CSA5-C: 2004.09.15. (NJ) – CSA6-C: 2004.09.15. (NJ) – CSA7-C: 2004.09.15. (NJ) – CSK1-K: 2004.09.15. (NJ) – DBO1-H: 2002.07.05. (CsG, ET, NJ, ON); 2002.09.25. (NJ, ON) – DBO1-H: 2003.05.13. (ME, NJ) – DBO1-HD: 2001.05.25. (BE, CsG, NJ, ON) – DFL1-HD: 2001.05.22. (BE, CsG, NJ, ON) – DKE1-H: 2002.07.05. (CsG, ET, NJ, ON) – DK10-K: 1999.08.31. (NJ) – DK11-H: 1998.06.22. (NJ); 2003.05.30. (AS, BG, CsZ, NJ); 2003.09.08. (BG, CsZ, NJ, ON) – DK11-HDC: 2001.05.07. (BE, CsG, NJ, ON) – DK12-C: 1998.09.01. (NJ); 1998.10.14. (NJ); 1999.06.08. (NJ); 1999.07.13. (NJ); 1999.08.31. (NJ); 1999.10.27. (NJ); 2001.10.09. (NJ); 2002.07.09. (NJ); 2002.10.07. (NJ); 2003.05.30. (AS, BG, CsZ, NJ); 2003.07.22. (ME, NJ); 2003.09.08. (BG, CsZ, NJ, ON); 2004.07.24. (ME, NJ); 2008.07.16. (NJ, ME); 2008.09.24. (NJ, ME) – DK13-C: 1999.07.13. (NJ); 1999.08.31. (NJ) – DRE2-C: 1997.07.28. (NJ); 1997.09.09. (NJ); 1998.06.22. (NJ); 1999.06.08. (NJ); 1999.07.13. (NJ); 1999.08.31. (NJ); 1999.10.27. (NJ); 2001.09.05. (NJ); 2001.10.09. (NJ); 2002.06.11. (NJ); 2002.07.09. (NJ); 2002.09.17. (NJ); 2003.09.08. (BG, CsZ, NJ, ON); 2008.07.17. (NJ, ME); 2008.09.15. (NJ, ME) – DRE2-HC: 2001.05.07. (BE, CsG, NJ, ON) – DRE2-K: 2004.07.25. (ME, NJ) – DRE3-C: 2003.07.24. (ME, NJ) – DSG1-H: 2003.05.28. (AS, BG, CsZ, NJ, VT) – DUF0-C: 2001.09.05. (NJ); 2001.10.09. (NJ); 2003.09.08. (BG, CsZ, NJ, ON) – DUF0-K: 1996.07.30. (NJ) – DUF1-C: 2002.09.17. (NJ) – DUF1-K: 1995.09.13. (NJ); 1999.06.08. (NJ); 1999.07.13. (NJ); 1999.08.31. (NJ); 1999.10.27. (NJ) – DUF2-C: 1998.09.01. (NJ) – DUF2-K: 1997.09.09. (NJ) – DUF3-K: 1995.09.13. (NJ); 2002.06.11. (NJ); 2002.09.17. (NJ) – DUF4-C: 1999.10.27. (NJ); 2001.09.05. (NJ); 2002.06.11. (NJ); 2002.09.17. (NJ); 2003.09.08. (BG, CsZ, NJ, ON) – DUF5-HD: 2001.05.07. (BE, CsG, NJ, ON) – DUH1-HD: 2001.05.23. (BE, CsG, NJ, ON) – DUJ1-HD: 2001.05.22. (BE, CsG, NJ, ON) – ERC1-HD: 2001.05.22. (BE, CsG, NJ, ON) – ERM1-K: 2002.07.02. (AS, BG, NJ, VT) – ESZ1-H: 2002.07.03. (AS, BG, NJ, VT); 2002.09.24. (NJ, ON); 2003.05.13. (ME, NJ) – ESZ2-HD: 2001.05.08. (BE, CsG, NJ, ON) – FEK1-D: 2003.09.10. (BG, CsZ, NJ, ON) – FEK1-H: 2003.05.28. (AS, BG, CsZ, NJ, VT) – GOD1-H: 1999.08.17. (ON) – GOD1-H: 1999.09.07. (ON); 1999.09.28. (ON); 1999.10.19. (ON); 1999.11.09. (ON); 2000.04.18. (ON); 2000.05.09. (ON); 2000.05.30. (ON); 2000.07.10. (ON); 2000.08.22. (ON); 2000.09.12. (ON); 2000.10.03. (ON); 2000.10.24. (ON); 2000.11.14. (ON); 2000.12.05. (ON); 2000.12.27. (ON); 2001.01.16. (ON); 2001.02.06. (ON); 2001.03.01. (ON); 2001.04.11. (ON); 2001.05.02. (ON) – GON1-C: 1998.09.02. (NJ) – GON1-H: 1998.09.02. (NJ) – GON2-HD: 2001.05.08. (BE, CsG, NJ, ON) – GOS1-D: 2003.07.26. (ME, NJ) – HAM1-HC: 2001.05.07. (BE, CsG, NJ, ON) – HRT1-HD: 2001.05.23. (BE, CsG, NJ, ON) – KIM1-H: 2002.07.04. (AS, NJ, ON) – KIM1-HD: 2001.05.25. (BE, CsG, NJ, ON) – KML1-K: 2003.09.10. (BG, CsZ, NJ, ON) – KOP1-H: 2002.07.02. (AS, BG, NJ, VT); 2002.09.23. (NJ, ON); 2003.05.14. (ME, NJ) – LIP3-K: 1999.10.28. (NJ) – LIP4-K: 1997.07.28. (NJ); 2003.07.24. (ME, NJ) – LUP1-H: 2002.07.05. (CsG, ET, NJ, ON) – MED1-C: 1998.09.02. (NJ); 2002.07.01. (AS, BG, NJ, VT) – MED1-H: 1998.06.23. (CsG, NJ, ON); 1998.09.02. (NJ); 2001.05.07. (BE, CsG, NJ, ON) – MMO1-D: 2003.05.28. (AS, BG, CsZ, NJ, VT) – MMO1-K: 2003.05.28. (AS, BG, CsZ, NJ, VT) – NAG1-H: 2002.07.04. (AS, NJ, ON); 2003.05.13. (ME, NJ) – NAG2-H: 2002.07.04. (AS, NJ, ON) – NBA2-H: 2002.07.01. (AS, BG, NJ, VT) – NMM1-K: 2002.07.02. (AS, BG, NJ, VT) – NMM2-K: 2002.07.02. (AS, BG, NJ, VT) – NOC1-K: 2003.07.24. (ME, NJ) – PAK1-HD: 2001.05.22. (BE, CsG, NJ, ON) – PIL1-H: 1998.10.15. (NJ, ON); 2003.05.13. (ME, NJ) – RAC1-HD: 2001.05.23. (BE, CsG, NJ, ON) – RAJ2-C: 2003.05.28. (AS, BG, CsZ, NJ, VT) – RAJ2-D: 2003.05.28. (AS, BG, CsZ, NJ, VT) – RAJ2-H: 2003.05.28. (AS, BG, CsZ, NJ, VT) – SCH1-K: 2003.09.09. (BG, CsZ, NJ, ON) – SCH2-K: 1998.10.14. (NJ); 1999.10.27. (NJ); 2002.09.17. (NJ) – SUT1-H: 1998.06.09. (CsG, NJ, ON) – SZL2-H: 2002.07.04. (AS, NJ, ON) – SZM3-DH: 2001.05.25. (BE, CsG, NJ, ON) – SZN1-H: 2002.07.05.

(CsG, ET, NJ, ON); 2003.05.13. (ME, NJ) – SZO1-H: 2003.05.13. (ME, NJ) – SZO1-HD: 2001.05.25. (BE, CsG, NJ, ON) – SZU1-HD: 2001.05.23. (BE, CsG, NJ, ON) – TAH1-H: 2002.07.05. (CsG, ET, NJ, ON); 2002.09.25. (NJ, ON); 2003.05.13. (ME, NJ) – TAT3-H: 2002.07.03. (AS, BG, NJ, VT); 2003.05.13. (ME, NJ) – TAT4-D: 2002.07.03. (AS, BG, NJ, VT) – TEJ2-D: 2003.07.25. (ME, NJ) – VAC2-C: 2002.07.04. (AS, NJ, ON) – VEN1-D: 2002.09.23. (NJ, ON) – VEN1-DC: 2001.05.07. (BE, CsG, NJ, ON) – VEN3-K: 2002.09.23. (NJ, ON) – VIS1-H: 2002.07.03. (AS, BG, NJ, VT) – VIS1-HD: 2001.05.25. (BE, CsG, NJ, ON) – VSZ1-H: 2002.07.05. (CsG, ET, NJ, ON) – ZAT1-D: 2003.07.23. (ME, NJ) – ZAT3-K: 2002.10.07. (NJ) – ZAT4-K: 1998.10.14. (NJ); 1999.10.27. (NJ); 2001.10.09. (NJ); 2002.10.07. (NJ)

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