**Supplement 1. Taxa, geographical distribution, stratigraphical range and reference material used in analyses**

| Serial number | Taxa                                | Author                          | Distribution                                      | Specimens and references                                      |
|---------------|-------------------------------------|---------------------------------|---------------------------------------------------|----------------------------------------------------------------|
| 1             | Anglaspis macculloughi              | Woodward, 1891                  | Prìdoli, Welsh Borders — UK, Lochkovian, Welsh Borders — UK & Artois | Original specimens from Wills (1935), Denison (1971), Keating et al. (2015). |
| 2             | Nahanniaspis mackenziei             | Dineley et Loeffler, 1976        | Lochkovian, Mackenzie Mountains (Arctic Canada)   | Original specimens from Dineley and Loeffler (1976).               |
| 3             | Anchipteraspis crenulata            | Elliott, 1984                   | Pridoli, Canadian Arctic                          | NMC.13855, Elliott (1984), Pernère and Elliott (2008).             |
| 4             | Protopteraspis vogti                 | (Kiaer, 1928)                   | Lochkovian, Spitzbergen, Novaya Zemlya            | Original specimens from Blieck (1981, 1982, 1984), Pernègre and Elliott (2008). |
| 5             | Errivaspis waynensis                | (White, 1935)                   | Lochkovian, Welsh Borders - UK                    | Original specimens from White (1935), Blieck (1984), Pernègre and Elliott (2008). |
| 6             | Gigantaspis laticephala             | (Blieck et Goujet, 1983)        | Pragian, Spitsbergen                              | Original specimens from Blieck and Goujet (1983), Pernègre and Goujet (1997). |
| 7             | Doryaspis nathorsti                 | (Lankester, 1884)               | Pragian, Spitsbergen                              | Original specimens from White (1935), Heintz (1968), Blieck (1984), Pernègre (2002). |
| 8             | Xylaspis prima                      | (Pernegre, 2003)                | Pragian, Spitsbergen                              | Pernègre (2003), Pernègre (2004), Pernègre and Elliott (2008).     |
| 9             | Woodfordaspis felixi                | Pernegre, 2006                  | Pragian, Spitsbergen                              | (Pernègre 2006).                                                  |
| 10            | Protaspis bucheri                   | Bryant, 1932                    | Emsian, Western USA                               | Original specimens from Bryant (1932, 1933, 1934), Denison (1970), Denison (1971), Blieck (1984). Here used the histology of Protaspis sp. from Denison (1973), text-fig. 4. |
| 11            | Drepanaspis gemuendenensis          | Schlüter, 1887                  | Emsian, Germany                                   | Original specimens from Gross (1963) including the juvenile specimens from Preußischen Geologischen Landesmuseum (dorsal side of body) and Kreuznach Museum (ventral side of body); thin section from Kiaer (1915); parts of cephalotorax GIT 508-1-3, original from Elliott and Mark-Kurik (2005). |
| 12            | Guericosteus kozlowski              | Halstead Tarlo, 1964            | Emsian,波兰                                     | Rostral plate (U.W., D. 21); oral plates (U.W., D. 23); pineal plate (U.W., D. 22); dorsal plate (U.W., D. 1); branchial plate (U.W., D. 7, D. 9, D.13); ventral plate (U.W., D. 4); cornual plate (U.W., D. 19); ridge scales (U.W., D. 25, D. 26); flank scales (U.W., D. 33, D. 31); thin section (U.W., D. 35). Halstead Tarlo (1964, 1965). |
| 13            | Guericosteus heterolepis            | (Preobrazhensky, 1911)          | Lower Eifelian, Baltic States (Lithuania, Latvia, Estonia), Belarus | Orbital plates (GIT 116-2); postorbital plates (GIT 116-3); branchial plates (GIT 116-1); dorsal plate (TUG 1554-2); tesserae (GIT 116-4, GIT 116-5); flank scales (GIT 116-6, GIT 116-7, GIT 116-8, GIT 116-14); ridge scales (GIT 116-9); thin section of median plate (PM SPU 86-3). Obruchev and Mark-Kurik (1965). |
| Page | Species | Author | Subphylum | Reference | Additional Information |
|------|---------|--------|-----------|-----------|------------------------|
| 14   | Schizosteus perner | Růžička, 1929 | Emsian-Eifelian, Czech Republic | Branchial plate (NM-Lc 62), Original specimen from Růžička (1929), Vaškaninová and Kraft (2016). |
| 15   | Schizosteus striatus | Gross, 1933 | Upper Eifelian - Lower Givetian, Main Devonian Field (NW part of Russia) | Rostral plate (GIT 116-48, GIT 116-47); postorbital plates (GIT 116-49); branchial plates (GIT 116-44, GIT 116-42); dorsal plate (GIT 116-51, thin section 87-130); ventral plate (GIT 116-52, GIT 116-53, juvenile specimen 116-55); flank scales (GIT 116-64, GIT 116-65, GIT 116-66); ridge scales (GIT 116-74); scales in association (GIT 116-70), tesserae (GIT 116-56, GIT 116-57), Obruchev and Mark-Kurik (1965), Mark-Kurik (1993). |
| 16   | Schizosteus asatkini | Obruchev, 1940 | Upper Eifelian - Lower Givetian, Main Devonian Field (NW part of Russia) | Branchial plates (PM SPU 66-10); associated cephalothorax (PIN RAN 220/489), Obruchev and Mark-Kurik (1965), Glinskiy (2014b). |
| 17   | Tartuosteus giganteus | Gross, 1933 | Lower Givetian, Main Devonian Field (Estonia, NW part of Russia) | Branchial plates (PM SPU 66-9); ventral plate (GIT 116-75, GIT 116-76); ridge scales (GIT 116-83). Obruchev and Mark-Kurik (1965), Glinskiy (2014b). |
| 18   | Tartuosteus maximus | Mark-Kurik, 1965 | Middle Givetian, Main Devonian Field (Latvia, Estonia, NW part of Russia) | Postorbital plates (GIT 116-85); dorsal plate (GIT 116-92, thin section PM SPU 87-330); cornual plates (GIT 116-94); ventral plate (GIT 25-2); body scales (GIT 116-103); ridge scales (GIT 116-111), tessera (GIT 116-102; GIT 116-104; GIT 116-10), Obruchev and Mark-Kurik (1965), Mark-Kurik (1968). |
| 19   | Pycnolepis splendens | Eichwald, 1844 | Upper Eifelian, Main Devonian Field (Latvia, Estonia, NW and south pre-Ural region of Russia) | Rostral plate (GIT 116-26); branchial plates (GIT 116-24); dorsal plate (GIT 116-28, thin section PM SPU 87-170); ventral plate (GIT 116-20); ridge scales (GIT 116-40); flank scales (GIT 116-30, GIT 116-31), possible discrete tesserae (GIT 116-36), Obruchev and Mark-Kurik (1965), Halstead Tarlo (1964, 1965), Moloshnikov (2012). |
| 20   | Pycnosteus palaeformis | Preobrazhensky, 1911 | Lower Givetian, Estonia, Latvia, NW part of Russia (Main Devonian Field), Sharya of Russia (Central Devonian Field), south pre-Ural region of Russia | Branchial plates (PM SPU 66-1); postorbital plates (PM SPU 66-2, PM SPU 66-3); branchial plates (GIT 116-114; PIN RAN 220/843; PM SPU 87-351), dorsal plate (PIN 220-844, thin section PM SPU 87-360); cornual plates (PM SPU 66-5), ridge scales (GIT 116-115), flank scales (PM SPU 66-7), Obruchev and Mark-Kurik (1965), Moloschnikov (2001), Glinskiy (2014b). |
| 21   | Pycnosteus pauli | Mark, 1956 | Lower Givetian, Main Devonian Field (Estonia, NW part of Russia) | Branchial plates (GIT 98-16, GIT 98-17); dorsal plate (GIT 98-19, thin section 87-420); ventral plates (GIT 98-15); ridge scale (GIT 116-117). Obruchev and Mark-Kurik (1965). |
| 22   | Pycnosteus tuberculatus | Rohon, 1901 | Middle Givetian, Main Devonian Field (Latvia, Estonia, NW part of Russia) | Orbital plate (GIT 116-119), marginal mediale (GIT 116-121), branchial plate (GIT 98-5, GIT 98-6, GIT 25-7); dorsal plate (GIT 116-118, GIT 98-4, thin section 87-600), ventral plate (GIT 98-3), cornual plates (GIT 25-3, GIT 25-4; GIT 25-6; GIT 116-120); discrete tesserae (GIT 98-10); ridge scales (GIT 116-126); flank scales (GIT 116-130), Obruchev and Mark-Kurik (1965), Mark-Kurik (1968). |
| 23   | Ganosteus artus | Mark-Kurik, 1965 | Lower Givetian, Main Devonian Field (Estonia, NW part of Russia) | Branchial plates (GIT 116-135); ventral plates (GIT 116-138-139); flank scales (GIT 116-140). Obruchev and Mark-Kurik (1965). |
| 24   | Ganosteus stellatus | Rohon, 1901 | Middle Givetian, Latvia, Estonia, NW part of Russia, south pre-Ural region of Russia | Branchial plates (GIT 25-8); postorbital plates (PM SPU 87-551); branchial plates (GIT 116-143, GIT 116-145), dorsal plate (GIT 116-141-142); cornual plate (GIT 116-150, GIT 116-152); ventral plate (GIT 116-153, tesserae (GIT 116-157); ridge scale (GIT 116-156, GIT 116-160), flank scale (GIT 116-159, GIT 116-161). Obruchev and Mark-Kurik (1965), Mark-Kurik (1968). |
| 25   | Psammolepis toriesis | Mark-Kurik, 1965 | Lower Eifelian, Main Devonian Field (Estonia) | Branchial plates (GIT 116-15, GIT 116-329); dorsal plate (GIT 25-9, thin section PM SPU 87-52); discrete tessera (GIT 116-364), body scales (GIT 116-18, GIT 116-19), ridge scales (PM SPU 87-53). Obruchev and Mark-Kurik (1965), Mark-Kurik (1968). |
| Id | Taxon Name                       | Author, Year | Age, Location                                      | Features                                                                                           |
|----|---------------------------------|--------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 26 | Psammolepis abavica             | Mark-Kurik, 1965 | Middle Givetian, Main Devonian Field (Latvia, Estonia, NW part of Russia) | Pineal plate (PIN RAN 1491/29); branchial plates (GIT 116-172); dorsal plate (GIT 116-175, GIT 116-176, GIT 116-177); ventral plate (PIN 1491/4, GIT 100-3); tesserae (GIT 116-180, GIT 116-181); ridge scales (PIN RAN 1491/15), flank scale (GIT 116-183, GIT 116-184). Obruchev and Mark-Kurik (1965), Mark-Kurik (1999). |
| 27 | Psammolepis paradoxa            | Agassiz, 1844 | Upper Givetian, Main Devonian Field (Latvia, Estonia, NW part of Russia) | Rostral plate (PIN RAN 1737/16); postbranchial plates (G 1109); branchial plates (MB. f. 13, PIN RAN 2443/8, thin section A.3-3); dorsal plate (P.M.O., A. 172, GIT 116-186, GIT 116-187); ventral plate (MB. f. 12, PIN RAN 1737/15); tesserae (GIT 116-190, GIT 116-191); ridge scale (GIT 116-194-195); flank scale (GIT 116-196, thin section A.3-2). Heintz (1957), Obruchev and Mark-Kurik (1965). |
| 28 | Psammolepis venyukovi           | Obruchev, 1965 | Upper Givetian - Lower Frasnian?, Main Devonian Field (Lithuania, Latvia, Estonia, NW part of Russia) | Rostral plate (GIT 116-214); postorbital plates (GIT 25-10); branchial plates (GIT 116-211, GIT 116-212); dorsal plate (GIT 116-215, GIT 116-218, thin section PM SPU 87-930); ventral plate (PIN RAN 1737/17, thin section A.3-3); cortical plate (GIT 116-219, GIT 116-221); flank scales (GIT 116-222, GIT 116-224). Obruchev and Mark-Kurik (1965), Mark-Kurik (1968). |
| 29 | Vladimirolepis proia comb. nov. | (Mark-Kurik, 1965) | Lower Givetian, Main Devonian Field (Estonia, NW part of Russia) | Orbital plates (PM SPU 66-8); branchial plates (GIT 116-168, 116-169); dorsal plate (GIT 116-166, GIT 116-167); ventral plate (GIT 116-165, VZ PC 1-3); cornual plates (GIT 116-170). Obruchev and Mark-Kurik (1965), Glinskiy (2014b). |
| 30 | Placosteus alatus comb. nov.     | (Mark-Kurik, 1965) | Upper Givetian, Main Devonian Field (Lithuania, Latvia, Estonia, NW part of Russia) | Branchial plates (GIT 116-202; GIT 116-203; GIT 116-204, GTC 43/165); dorsal plate (GIT 116-207, GTC 5-1213, thin section PM SPU 87-830); ventral plate (GIT 116-206); ridge scale (GIT 116-208, GIT 116-209). Obruchev and Mark-Kurik (1965), Lyarskaya (1971). |
| 31 | Placosteus undulatus             | (Agassiz, 1844) | Upper Givetian-Lower Frasnian?, Main Devonian Field (Scotland, Lithuania, Latvia, Estonia, NW part of Russia, Timan (Russia), Donbas (Ukraine)) | Branchial plates (GIT 116-225, thin section A.3-6); dorsal plate (GIT 116-230, juv. GIT 116-231, PIN RAN 1737/17, thin section A.3-7); ventral plate (GIT 2207/17, thin section A.3-7); ventral plate (GIT 116-226); ridge scale (GIT 116-234). Obruchev and Mark-Kurik (1965). |
| 32 | Elgaia luhai comb. nov.         | (Mark-Kurik, 1965) | Lower Givetian, Main Devonian Field (Estonia) | Brachial plates (GIT 116-112, TUG 99-4, thin section VZ PC 1-22); dorsal plate (GIT 116-113). Obruchev and Mark-Kurik (1965). |
| 33 | Psammosteus bergi               | (Obruchev, 1943) | Middle Givetian, Main Devonian Field (Latvia, Estonia, NW part of Russia) | Brachial plates (PIN RAN 220/504, TUG 6138-10, GIT 116-237, GIT 116-239); postbranchial plate (GIT 116-237); body scales in association (GIT 497-1); single element (GIT 860-380); complex elements; discrete tesserae. Obruchev (1943a); Obruchev and Mark-Kurik (1965); Mark-Kurik (1993); Mark-Kurik (1999); Glinskiy and Nilov (2017); Elliott and Mark-Kurik (2005). |
| 34 | Psammosteus praecursor          | Obruchev, 1947 | Lower Frasnian?, Latvia, Estonia, NW and central part of Russia, Timan | Branchial plates (PIN RAN 220/324, TSNIGR 6-8147, GIT 116-237, GIT 116-239); postbranchial plate (GIT 497-4); dorsal plate (GIT 116-249, juvenile GIT 25-11); ridge scales (PIN RAN 220/503); body scales in association (GIT 497-1); single element (GIT 860-380); complex elements; discrete tesserae. Obruchev (1943a); Obruchev and Mark-Kurik (1965); Mark-Kurik (1993); Mark-Kurik (1999); Glinskiy and Nilov (2017); Elliott and Mark-Kurik (2005). |
| 35 | Psammosteus maeandrinus         | Agassiz, 1844 | Middle Frasnian, Latvia, Estonia, NW part of Russia, Timan | Branchial plates (PIN RAN 220/684, PIN RAN 220/802, PM SPU 87-1050); dorsal plate (PIN RAN 220/257, PM SPU 87-1051); pineal plate (PIN RAN 220/843); ridge scale (PM SPU 87-1090); flank scale (PM SPU 1100); discrete tesserae (GIT 116-356, PM SPU 1100). Obruchev and Mark-Kurik (1965), Glinskiy and Nilov (2017). |
| Page | Scientific Name                  | Author, Year | Location                          | Associated Features                                                                                   | References                                                                 |
|------|---------------------------------|--------------|-----------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| 36   | Psammosteus livonicus            | Obruchev, 1965 | Lower Frasnian?, Latvia, NW part of Russia | Branchial plates (PIN 1737/7, GIT 116-273, thin section A.3-1); ridge scale (PIN 1737/9); rooted tesserae (GIT 116-327, PM SPU 71-7); discrete tesserae (PM SPU 71-5). Obruchev and Mark-Kurik (1965), Elliott and Mark-Kurik (2005), Glinskiy and Mark-Kurik (2016), Glinskiy & Nilov (2017). | Obruchev and Mark-Kurik (1965), Elliott and Mark-Kurik (2005), Glinskiy and Mark-Kurik (2016), Glinskiy & Nilov (2017). |
| 37   | Psammosteus levis                | Obruchev, 1965 | Middle Frasnian, NW part of Russia (Eastern part of MDF) | Branchial plates (PIN RAN 220/635, PIN RAN 220/635a); body scales in association (PM SPU 87-1230); discrete tesserae (PM SPU 87-1220). Obruchev and Mark-Kurik (1965). | Obruchev and Mark-Kurik (1965). |
| 38   | Psammosteus asper                | Obruchev, 1965 | Middle Frasnian, NW part of Russia (Eastern part of MDF) | Branchial plates (PIN RAN 220/771, PM SPU 87-1251); dorsal plate (PM SPU 87-1260, thin section PM SPU 87-1265); ridge scales (PM SPU 87-1270); flank scales (PM SPU 87-1271); discrete tesserae (PM SPU 87-1280). Obruchev and Mark-Kurik (1965). | Obruchev and Mark-Kurik (1965). |
| 39   | Psammosteus cuneatus             | Obruchev, 1965 | Middle Frasnian, NW part of Russia (Eastern part of MDF) | Branchial plates (PIN RAN 220/793, PM SPU 87-1300, PM SPU 87-1301); dorsal plate (PM SPU 87-1302); body scales (PM SPU 87-1308); discrete tesserae (PM SPU 87-1310, thin section PM SPU 87-1311). Obruchev and Mark-Kurik (1965). | Obruchev and Mark-Kurik (1965). |
| 40   | Psammosteus megalopteryx         | (Trautschold, 1880) | Middle Frasnian, Scotland, Latvia, NW part of Russia | Branchial plates (ZPALWr. E39/P, PIN 220/325, G.63/226, G 63/227, 1904.2.10. R.S.M., PM SPU 87-1371), juvenile branchial plates (PIN 220/69, PIN 220/157); dorsal plate (1894.169.3 R.S.M., 1960.9 R.S.M., P.10956 B.M., PIN 220/541, PIN 220/545, TSNIGR-58147; thin section PM SPU 87-1400); ventral plate (P. 10956 B.M.); flank and ridge scales in association (PIN RAN 220/302, 220/539); discrete tesserae (PM SPU 75-13). Obruchev (1947), Obruchev & Mark-Kurik (1965), Tarlo (1961), Glinskiy and Ivanov (2015), Glinskiy and Nilov (2017). | Obruchev (1947), Obruchev & Mark-Kurik (1965), Tarlo (1961), Glinskiy and Ivanov (2015), Glinskiy and Nilov (2017). |
| 41   | Psammosteus tenuis               | Obruchev, 1947 | Upper Frasnian, NW part of Russia | Branchial plates (PIN RAN 220/353, PIN RAN 220/349, VZ PC 1-48, thin section PM SPU 87-1460); discrete tesserae (GIT 780-1). Obruchev (1947), Obruchev and Mark-Kurik (1965). | Obruchev (1947), Obruchev and Mark-Kurik (1965). |
| 42   | Karelosteus weberi               | Obruchev, 1933 | Middle Frasnian, NW part of Russia (Eastern part of MDF) | Branchial plates (TSNIGR 4014-1, PM SPU 72-1); discrete tesserae (PM SPU 72-2); rooted tesserae from dorsal plate (PM SPU 72-3); isolated tubercle (thin section PM SPU 72-4). Obruchev 1933, Obruchev and Mark-Kurik (1965), Glinskiy (2012a). | Obruchev 1933, Obruchev and Mark-Kurik (1965), Glinskiy (2014a). |
| 43   | Traquairosteus ? ramosus         | (Glinskiy, 2017) | Lower Frasnian?, Latvia, NW part of Russia | Branchial plates (PM SPU 80-1, PM SPU 80-2, G 43/292:2), body scale (PM SPU 80-4), discrete tesserae (PM SPU 80-5, PM SPU 80-7), Glinskiy and Nilov (2017). | Branchial plates (PM SPU 80-1, PM SPU 80-2, G 43/292:2), body scale (PM SPU 80-4), discrete tesserae (PM SPU 80-5, PM SPU 80-7), Glinskiy and Nilov (2017). |
| 44   | Traquairosteus ? kiaeri          | (Halstead Tarlo, 1964) | Middle Frasnian, Arctic Canada, probably NW part of Russia | Branchial plates (P.M.O., A.13196-A. 13197), Klaer (1915), Halstead Tarlo (1964, 1965). Also included the material on the 7.7 cf. kiaeri from the NW part of Russia: branchial plate (PM SPU 87-1501); flank scale (PM SPU 87-1520); single elements (PM SPU 75-1); thin section PM SPU 87-1510). Glinskiy and Ivanov (2015), Glinskiy and Nilov (2017). | Branchial plates (P.M.O., A.13196-A. 13197), Klaer (1915), Halstead Tarlo (1964, 1965). Also included the material on the 7.7 cf. kiaeri from the NW part of Russia: branchial plate (PM SPU 87-1501); flank scale (PM SPU 87-1520); single elements (PM SPU 75-1); thin section PM SPU 87-1510). Glinskiy and Ivanov (2015), Glinskiy and Nilov (2017). |
| 45   | Traquairosteus ? pectinatus      | (Obruchev, 1965) | Middle Frasnian, NW part of Russia | Branchial plates (PIN RAN 220/259, PM SPU 87-1551). Obruchev and Mark-Kurik (1965), Glinskiy and Ivanov (2015). | Branchial plates (PIN RAN 220/259, PM SPU 87-1551). Obruchev and Mark-Kurik (1965), Glinskiy and Ivanov (2015). |
| 46   | Traquairosteus ? falcatus        | (Obruchev et Gross, 1942) | Upper Frasnian, Scotland, Latvia, NW and Central part of Russia, Timan | Branchial plates (1904.2.12 R.S.M., G 15-2, G 43/272, PIN 220/324, PIN 220/327, thin section PM SPU 87-1580); dorsal plate (PIN 220/321); flank scale (PM SPU 87-1581); discrete tesserae (PM SPU 75-9-10, PIN 220/840-842). Traquair (1986), Tarlo (1961), Gross (1942), Obruchev and Mark-Kurik (1965). | Branchial plates (1904.2.12 R.S.M., G 15-2, G 43/272, PIN 220/324, PIN 220/327, thin section PM SPU 87-1580); dorsal plate (PIN 220/321); flank scale (PM SPU 87-1581); discrete tesserae (PM SPU 75-9-10, PIN 220/840-842). Traquair (1986), Tarlo (1961), Gross (1942), Obruchev and Mark-Kurik (1965). |
Obruchevia heckeri (Obruchev, 1936) Upper Frasnian, NW part of Russia
Branchial plates (PIN 87/10, 87/11, Pl 10/8); dorsal plate (TSNIGR 4680-1, PIN 87-6, PM SPU 87-1751, thin sections PM SPU 87-1760; PM SPU 87-1761); ventral plate (Pl 10/10). Obruchev (1941), Halstead Tarlo (1964, 1965), Elliott, Mark-Kurik and Daeschler (2004).

Perscheia pulla Elliott, Mark-Kurik et Daeschler, 2004
Upper Frasnian, Arctic Canada
Dorsal plate (CMN-NUFV 101-104); ventral plate (CMN-NUFV 105); thin section of median plate (CMNNUFV106). Elliott, Mark-Kurik and Daeschler (2004), Elliott and Mark-Kurik (2005).

| Database | Location |
|----------|----------|
| CMN-NUFV | Canadian Museum of Nature (CMN), Nunavut Fossil Vertebrate (NUFV) catalogue, Ottawa, Canada |
| GIT | Institute of Geology at Tallinn University of Technology, Tallinn, Estonia |
| GTC | Nature Research Centre (GTC 1690), Vilnius, Lithuania |
| MB f. | Fossil collections of Natural History Museum, Berlin, Germany |
| NM-Lc | National Museum, Prague, Czech Republic |
| P. (B.M.) | Department of Palaeontology of the British Museum of Natural History, London, England |
| PIN | Borisiak Palaeontological Institute of the Russian Academy of Sciences, Moskow, Russia |
| PI and G | Latvian Natural History Museum (Dabas Musejs), Riga, Latvia |
| PM SPU | Palaeontological Museum of St. Petersburg State University, St. Petersburg, Russia |
| P.M.O., A. | Palaeontological collections in NHM Oslo University, Oslo, Norway |
| R.S.M. | Royal Scottish Museum, Edinburgh, Scotland |
| TSNIGR | Central scientific research geological survey museum named after Academician F.N. Chernyshev, Saint Petersburg, Russia |
| TUG | Geocollections of the University of Tartu, Estonia |
| VZ PC and A.3 (thin sections). | Paleontological collections of Museum of the Department of Vertebrate Zoology, St. Petersburg State University, St. Petersburg, Russia |
| ZPALWr. | Department of Paleozoology, Zoological Institute Wroclaw University, Poland |

Supplementary references
Blieck, A. 1981. Le genre Protopteraspis Leriche (Vertébrés, Hétérostracés) du Dévonien inférieur Nord-Atlantique. *Palaeontographica, Abteilung A* 173 (5-6):141–159.
Blieck, A. 1982. Les Hétérostracés (Vertébrés Agnathes) de l’Horizon Vogti (Groupe de Red Bay, Dévonien inférieur du Spitsberg). Paris: Cahiers de Paléontologie, éditions du CNRS.
Blieck, A., and Goujet, D. 1983. *Zascinaspis laticephala* nov. sp. (Agnatha, Heterostraci) du Dévonien inférieur du Spitsberg. *Annales de Paléontologie* 69 (1):43–56.
Supplement 2. Data matrix used in the phylogenetic analysis

| Species                     | Code          |
|-----------------------------|---------------|
| Anglaspis macculloughi      | 0011          |
| Nahanniaspis mackenziei     | 0100          |
| Anchipteraspis crenulata    | 1020001000    |
| Protoperteraspis vogti      | 2020001000    |
| Erriaspis waynensis         | 2032100010    |
| Gigantaspis laticephala     | 2020010000    |
| Woodfjordspis felixi        | ???????????? |
| Doryaspis nathorsti         | 2124100010    |
| Xylaspis prima              | 1021000010    |
| Protaspis bucheri           | 2020010000    |
| Drepanaspis juvenile        | 2011000010    |
| Drepanaspis gemuendenensis  | 2100010000    |
| Guerichosteus kozlowskii    | 2211000010    |
| Guerichosteus heterolepis   | 2211000010    |
| Schizosteus perneri         | ???????????? |
| Perscheia pulla             | ???????????? |
| Obruchevia heckeri          | 2214010010    |
| Tartuosteus giganteus       | ???????????? |
Psammosteus_livonicus

Psammosteus_asper

Psammosteus_levis

Psammosteus_tenuis

Karelosteus_weberi

Traquairosteus_ramosus

Traquairosteus_falcatus

Traquairosteus_pectinatus

Traquairosteus_kiaeri