SUPPLEMENTS 1–2.

Vadim Glinskiy

Phylogenetic relationships of psammosteid heterostracans (Pteraspidiformes), Devonian jawless vertebrates

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	Prìdoli, Canadian Arctic	NMC.13855, Elliott (1984), Pernègre 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 (2007).
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	*Woodfjordaspis 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	*Guerichosteus kozlowskii*	Halstead Tarlo, 1964	Emsian, Poland	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	*Guerichosteus 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).

14	*'Schizosteus' perneri*	(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 (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 116-257); branchial 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 116-29); 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	Rostral plate (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	Rostral 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 toriensis*	(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).

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); ventrale (PIN 1491/4, GIT 100-3); tesserae (GIT 116-180, GIT 116-181); ridge scales (PIN RAN 1491/5), 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 220/398); ridge scales (GIT 116-219, GIT 116-221); flank scales (GIT 116-223, 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-Lover 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 (G601); ridge scale (GIT 116-234). Obruchev and Mark-Kurik (1965).
32	*Elgaia luhai* comb. nov.	(Mark-Kurik, 1965)	Lower Givetian, Main Devonian Field (Estonia)	Branchial 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)	Branchial plates (PIN RAN 220/504, TUG 6138-10, GIT 116-237, GIT 116-239 juv?, thin section PM SPU 87-999); postorbital 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 680-380); 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 220/324, TSNIGR 6-8147, GIT 116-266, PM SPU 87-1001, PM SPU 87-1002, thin section PM SPU 1020); dorsal plate (GIT 116-258, TUG 1552-7); ventral plate (TSNIGR 2/8147); ridge scales (TSNIGR 1-8147); flank scales (PIN 1737-18); rooted tesserae (PM SPU 87-1030); discrete tesserae (PM SPU 87-1035). Obruchev and Mark-Kurik (1965).
35	*Psammosteus maeandrinus*	Agassiz, 1844	Middle Frasnian, Latvia, Estonia, NW part of Russia, Timan	Branchial plates (PIN 220/684, PIN 220/802, PM SPU 87-1050); dorsal plate (PIN 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 75-12). Obruchev and Mark-Kurik (1965), Glinskiy and Nilov (2017).

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).
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), Ivanov and Lukshevich (2015).
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).
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).
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., 1900.60.30 R.S.M., P.10956 B.M., PIN 220/541, PIN 220/545, TSNIGR -5/8147; 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), Keating et al. (2015), 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).
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 (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).
44	*Traquairosteus ? kiaeri*	(Halstead Tarlo, 1964)	Middle Frasnian, Arctic Canada, probably NW part of Russia	Branchial plates (P.M.O., A.13196-A. 13197). Kiaer (1915), Halstead Tarlo (1964, 1965). Also included the matherial on the *T.?* 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).
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 (1896), Tarlo (1961), Gross (1942), Obruchev and Mark-Kurik (1965).

47	*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).
48	*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).

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
Pl 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.	Paleontological 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

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Supplement 2. Data matrix used in the phylogenetic analysis

Anglaspis_macculloughi 0011---000000--0-0000---100000--013002200000-0111010100100----0-010-??0---1111100001-??000-------000?0???---00?0?0-??0-0

Nahanniaspis_mackenziei 0010---0000?0--0-0000---000100--013002200000-1010-?0103000----0-010-?00---??10000000-??000-------00000??0---00?0?0-?????

Anchipteraspis_crenulata 1020001000??0--0-1001102?00000-20?00101001020010102011200 0----0-???-????????100200??-??001------0????????---00?0?1-?????

Protopteraspis_vogti 2020000100011300010021011100 00-0000010101122001010201111 00----0-010-?00---1100110000-???00200201011[0 1]111???---00?011-0?0-0

Errivaspis_waynensis 2032100220101212011120111000 00-0010010100122010211010131 00----1-010-?00---1100110000-??00200[1 2]01011[0 1]112??1---00?011-??100

Gigantaspis_laticephala 2020100200101212131120 11?10010-0303000101012010210210131 00----1-0?1-?00---0000110000-??0120000?011[0 1]1?2???---00?000-???00

Woodfjordaspis_felixi ?????0?2????111211112?01?00000-30000122??????????????1?100----1-0?1-?00---00?01?00??-?????0??????????????---[0 1]0?0??-???0?

Doryaspis_nathorsti 2124100200111102110020111 00100-3100012000012 01?41020013100----1-0?2-?00---010011000?-??00220111301[0 1]011??1---[0 1]0?010-???00

Xylaspis_prima 1020100200?1120211112111?00010-1001012200112010211200131 00----1-0?0--00---0?1?1101011??110-------???????----[0 1]0?000-???0?

Protaspis_bucheri 2020100200??121211112020?10010-100001?10102??1??1020013100----1-00?-??0---??1110010 11??110-------1[0 1]1?????---00?001-??101

Drepanaspis_juvenile 20?1[0 1]01201??1000010?3101?01?11002000??2??????????2???1??100----????3?????--?21120001[0 1]00?113000224011 10???2???20[0 1 2]???-???01

Drepanaspis_gemuendenensis 210[1 3][0 1]1[0 1]3[0 1]1201[0 3]00[0 2]10?3101201?[0 1]100200010200?0?-00022-0122100----?0[0 1][0 1]30010---12112000[1 2][0 1]0001130[0 1]0224011102002000 20[0 1 2]1110??101

Guerichosteus_kozlowskii 2??1[0 1]1??0???13???20?3??1??1?????20??????????????2????22100----1?1?320?0---?2113000[1 2]0000213010?24011??200???030[3 4]11[0 1 2]-??101

Guerichosteus_heterolepis 2????1?????????0????3101201??????????????????????????0122100----1?????????--?2113000?000?21????????11??200?00030[3 4]11[0 1]-01101

Schizosteus_perneri ??114010?000?01????????11???0????0303010-???01

Perscheia_pulla ??????????????????????????????21?5121022??0211???1?2??-?-00----11??3?0?0---?2???????????21?????????????????--30----2111

Obruchevia_heckeri ????????????1??????????????1210[4 5]1210223---0-2??0????-2-00----11??3?0?0---?21140101130021?????????????????---0----21?1

Tartuosteus_giganteus 2??????????????????3?????1??210??????????????2????2?100----100?3101102[0 1]?21140131102021?????????????0??00?31[0 1]012-?1101

Tartuosteus_maximus 2???????????1???0???3??3??1?22102030?221?0-????022-??22100----1001310 11?-[0 1]?21140 2311020213110?24011??20??00031[0 1]012-?1101

Pycnolepis_splendens 2?01[0 1]1030???1???????3?????1?22102030?22?????????????[2 3]21100110 1?1?421?1---?21140[1 2][0 2]30[1 2]1021????????11??2?0?[0 1]0030[2 3]012-11101

Pycnosteus_palaeformis 2????1??????1??00???3101?01?221020301 22?????????2??0122100----121?43121---?21140[1 2][0 2]30[1 2]20213110?24011??200?00?303012-01101

Pycnosteus_pauli 2??????????????????3?????1??21?2030122?????????2????22100----121?43121---?2114022302202 1?????????????????00?[2 3]0301[2 3]201101

Pycnosteus_tuberculatus 2????1?????????00???3100?01?221020?0?2???????????2??0?22100----121?43121---?21140[2 3]23022[0 1]213010?24011??200?000[2 3]0301[2 3]201101

Ganosteus_artus 2??????????????????3?????1??21?????????????????2????2?1?0?????21?4212?---?2114020?1??121????????21???1?????323?1[2 3]-?1101

Ganosteus_stellatus 2??1110?????1???0???3?????1?221020301 22?????????2????22100----121?42121---?2114[0 1][2 3]031111213[0 1]10?24021??211?00032311[2 3]-01101

Psammolepis_toriensis 2??????????????????3?????1??2??2?3????????????2????[2 3]2120[0 1]0[1 2]01????????????21140111110021????????11??2[0 1]??0?031[0 1]01[2 3]-?1101

Psammolepis_abavica 2???????????130??20?3?????1??21?????????????????2?????[2 3]?120[0 1]0[1 2]0100?5101302[0 1]?21140[0 1]11???021????????11??2[0 1]??00031[0 1]01[2 3]-?1101

Psammolepis_paradoxa 2?0311030???1??00???3103201?121020301 22?????????2??0?[2 3][1 2]120[0 1]0[1 2]0100?5101302[0 1]?211401111110 21???????011??2[0 1]0?0003[0 1][1 2]01[2 3]-11101

Psammolepis_venyukovi 2?0311030???1???????3??3??1?[1 2]210[2 4]1[2 3]0?22?????????2???1[2 3]1120[0 1]0[1 2]0100?5???3????2114011111102 1????????11???[0 1]1??003[0 1][1 2]11[2 3]-11101

Schizosteus_asatkini 2??????????????????3?????1?221020200 22?????????2????22100----111?3101?---?2114?10[1 2]1010213??????????????????31[1 2]012-11101

Schizosteus_striatus 2?01[0 1]1030???????????3??1??1?12112020?22?????????2????22100----111?310110-[0 1]?2114010[1 2]101021???????011102[0 1]0?[0 1]0021[0 1 2]012011101

Vladimirolepis_proia ??0111030???????????310?1?1?0321[0 1]02112201[0 1]1[1 2]001022-0?[2 3]1130[0 1]0[1 2]0112?5102212[0 1 2]?211401[0 3]2101021?????????????[0 1]?????2[0 1][1 2]012[0 1]21101

Placosteus_alatus ??????????????????3?????1?032[1 2]102102 2?????????2????[2 3]2141[1 2][0 1][1 2]0132?5--22122?2114010210102 1??????????????????2[0 1][1 2]012[0 1]21101

Placosteus_undulatus ??????????????????3?????1?032[1 2]102102200022101022-??[2 3]2141[1 2][0 1][1 2]0132?5--22122??1140102101021????????????????2[0 1][1 2]012[0 1]21101

Elgaia_luhai ??????????????????3?????1???????21122?????????????3?15?2[1 2][0 1]01?????????????14[0 1]30310112?????????????????20[1 2]012[0 1]21101

Psammosteus_bergi ???????????1???0???3??2??1?14?241211220112[1 2]0010101??3?15122[0 1]11?????????????1413341011 2?????????211022[0 1]?21220[1 2]012[0 1]21101

Psammosteus_praecursor ??????????????????3?????1?1??2??21122100-11010?????3?15122[0 1]1140?6--242[0 1]2???1413[0 3]410[0 1][1 2]2?????????21??22[0 1]?21220[1 2]012021101

Psammosteus_maeandrinus ???????????1400?20?3?????1?????????????????????????3?15122[0 1]11?????????????1413[0 3]4101[1 2]2?????????21??22[0 1]?21220[1 2]012021101

Psammosteus_megalopteryx ???????????????0???3?????1?142[0 2]41211221[0 1]0-11110101??3?15122[0 1]1140?5--?42[0 1]2???1414041002220-------211022[0 1]?21220[1 2]012221101

Psammosteus_cuneatus ??????????????????3?????1????????????????????????3?151?????????????????1414[0 3]410022?????????21??22[0 1]?21?20[1 2]012221101

Psammosteus_livonicus ??????????????????????3?????1?14?24121?2?10[0 1]-?-010?????3?15122[0 1]11??????????????14130410022??????????????2??21320[2 3]01[2 3][0 2]21101

Psammosteus_asper ??????????????????????3?????1?14??412112??????????????3?15122?11??????????????14140410022?????????21??22??21320[2 3]01[2 3]221101

Psammosteus_levis ??????????????????????3?????1????????????????????????????1?1??????????????????14140410022????????211022[0 1]?21?2[0 1][1 2]012221101

Psammosteus_tenuis ??????????????????????3?????1????????????????????????????1?1??????????????????14140410022????????????????2122[0 1][2 3]013[1 2]21101

Karelosteus_weberi ??????????????????????3?????1????????????????????????????1?12?0??????????????141?0410022????????????????2?320[3 4]01[2 3]-21101

Traquairosteus_ramosus ??????????????????????3?????1????????????????????????????1?122[0 1]1??????????????141404100 22?????????2[1 2]???21?21420[3 4]014[2 3]21111

Traquairosteus_falcatus ??????????????????????3?????1????????????????????????????3?15122?11??????????????14140410022??????????[1 2]??????21420[3 4]014[2 3]21111

Traquairosteus_pectinatus ??????????????????????3?????1????????????????????????????1?1??????????????????1414041?022??????????????????21?20[3 4]014[2 3]2?111

Traquairosteus_kiaeri ??????????????????????3?????1????????????????????????????1?1??????????????????1414041?022????????[1 2]??????21420[3 4]014[2 3]2?111