

## Appendix S3 – List of occurrences

### A review of the glacial environment arthropod trace fossils *Umfolozia* and *Warvichnium* with the description of new ichnotaxa

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**Table S1.** List of occurrences of the ichnotaxon *Umfolozia sinuosa* Savage, 1971. Records from the Dwyka Group (Karoo Supergroup – South Africa), Sydney Basin (Australia), Falkland Basin (Falkland Islands), Hoyada Verde Formation (San Eduardo Group, Calingasta – Uspallata Basin – Argentina), San Rafael and Paganzo Basins (Argentina), San Gregorio Formation (Cerro Largo Group, Paraná Basin – Uruguay), and Itararé Group (Paraná Basin – Brazil).

Year	Original description	Author(s)	Page(s)	Plate(s)	Figure(s)
1955	<i>Ichnispica</i> sp.	Lessertisseur		V	1
1971	<i>Diplichnites govenderi</i>	Savage	223–224		7–8
1971	<i>Umfolozia sinuosa</i>	Savage	222–223		5–6
1971	<i>Protichnites</i> spp. ‘A + B’	Savage	226–227		10–11
1975a	<i>Umfolozia sinuosa</i>	Anderson	269, 271		6c–d, 8e
1981	<i>Umfolozia sinuosa</i>	Anderson	87–88, 90, 93	1, 2, 3, 4	1, 1–4, 1–3, 1–3
1981	<i>Umfolozia</i>	Kingsley	31		12
1984	<i>Umfolozia</i> sp.	Archer & Maples	456		7D
1989	<i>Umfolozia</i>	Marques-Toigo <i>et al.</i>			
1989	<i>Umfolozia</i>	Carvalho & Fernandes			16
1989	<i>Umfolozia</i>	Dias-Fabré & Guerra-Sommer	86	2	2, 5
1991	<i>Umfolozia sinuosa</i>	Aceñolaza & Buatois	103	III	6
1992	<i>Umfolozia sinuosa</i>	Stefan			
1993	<i>Umfolozia</i> cf. <i>sinuosa</i>	Melchor <i>et al.</i>	15		32
1994	<i>Diplichnites gouldi</i> form A	Trewin & McNamara	194		18a–b, 19a
1994	<i>Umfolozia</i> cf. <i>sinuosa</i>	Han & Pickerill	239		8E
1997	<i>Umfolozia</i>	Peralta <i>et al.</i>	151	1	B
2000	<i>Umfolozia</i>	Trewin	984		3
2001	<i>Umfolozia</i>	Nogueira & Netto	402		4b, 4d
2003a	? <i>Umfolozia</i> isp.	Buatois & Mángano	62		5E
2007	<i>Umfolozia</i> cf. <i>sinuosa</i>	Paredes	41		32
2009	<i>Umfolozia sinuosa</i>	Netto <i>et al.</i>	250		9
2010	<i>Umfolozia sinuosa</i>	Buatois <i>et al.</i>	160, 163, 165		8D, 10, 11
2012b	<i>Umfolozia sinuosa</i>	Netto <i>et al.</i>	44–45		5A, 6B
2015	<i>Umfolozia sinuosa</i>	Lima <i>et al.</i>	141–144		4D, 5G
2017	<i>Umfolozia sinuosa</i>	Lima <i>et al.</i>	6		4
2021	<i>Umfolozia sinuosa</i>	de Barros <i>et al.</i>	5, 8		3G

2021	<i>Umfolozia sinuosa</i>	Netto <i>et al.</i>	4		3C
2022	<i>Umfolozia sinuosa</i>	Verde <i>et al.</i>	8		5F

**Table S2.** List of occurrences of the ichnotaxon *Umfolozia riojana* (Aceñolaza, 1978) nom. rev. emend. Records from Ecca Group (Karoo Basin – South Africa), Paganzo Basin (Argentina), and Rio do Sul Formation (Itararé Group, Paraná Basin – Brazil).

Year	Original description	Author(s)	Page(s)	Plate(s)	Figure(s)
1978	<i>Mirandaichnium riojanum</i>	Aceñolaza	29		3–8
1981	<i>Umfolozia longula</i>	Anderson	93–94	4	4–5, 6A–C
1991	<i>Umfolozia</i> cf. <i>U. longula</i>	Aceñolaza & Buatois	103	III	2
1993	<i>Umfolozia sinuosa</i>	Aceñolaza & Buatois	190		5A
1993	<i>Umfolozia</i> cf. <i>U. longula</i>	Aceñolaza & Buatois	190		5C
1998	<i>Umfolozia</i> cf. <i>U. longula</i>	Zhang <i>et al.</i>	235		12D
2002	<i>Umfolozia longula</i>	Trewin <i>et al.</i>	10		7
2007	<i>Umfolozia sinuosa</i>	Gandini <i>et al.</i>	54		5F

**Table S3.** List of occurrences of the ichnotaxon *Umfolozia terere* isp. nov. Found only in the Aquidauana Formation (Itararé Group, Paraná Basin – Brazil).

Year	Original description	Author(s)	Page(s)	Figure(s)
2021	<i>Umfolozia sinuosa</i>	de Barros <i>et al.</i>	8	4A–C

**Table S4.** List of occurrences of the ichnotaxon *Warvichnium ulbrichi* Walter, 1985. Records from Near Liebegast (SW of Hoyerswerda – Germany), Pašaminė sections (Lithuania), Union site (Canada), Varved deposits at Plecevice (Mazovia Lowland – Poland), and Holocene Baltic Sea (Near Uppsala – Sweden).

Year	Original description	Author(s)	Page(s)	Plate(s)	Figure(s)
1938	‘trace fossil’	Schwarzbach			
1940	‘trace fossil’	Schwarzbach			
1963	NA	Ludwig			
1965	‘trace fossil’	Hannemann			
1978	‘V-shaped tracks’	Gibbard & Dreimanis	1971		2A–B
1980	‘Morphotype B’	Merta	167	1	2
1985	<i>Warvichnium ulbrichi</i>	Walter	103, 104, 112, 114	I, III	2, 3
2004	? <i>Warvichnium</i>	Gaigalas & Uchman	22		5D
2008	<i>Warvichnium ulbrichi</i>	Uchman <i>et al.</i>	220		7B
2009	<i>Warvichnium ulbrichi</i>	Uchman <i>et al.</i>	204–205		5C, 6
2011	? <i>Warvichnium ulbrichi</i>	Uchman & Kumpulainen	139		5D
2022	‘Unnamed arthropod trackway’	Wójcik-Tabol <i>et al.</i>	7		5B

**Table S5.** List of occurrences of the ichnotaxon *Irichnus saltatorius* Skompski, 1991. Records from Near Liebegast (SW of Hoyerswerda – Germany), Pašaminė sections and south of Kaunas (Lithuania), Radzików Formation (W Poland) and Aquidauana Formation (Itararé Group, Paraná Basin – Brazil)

Year	Original description	Author(s)	Page(s)	Plate(s)	Figure(s)
1985	<i>Warvichnium ulbrichi</i>	Walter	112	I	7, 8
1986	<i>Warvichnium ulbrichi</i>	Walter			4
1988	<i>Warvichnium ulbrichi</i>	Fuchs			2
1991	<i>Irichnus saltatorius</i>	Skompski	124	1	4
1991	<i>Irichnus streketus</i>	Skompski	124	1	5b
2004	<i>Warvichnium ulbrichi</i>	Gaigalas & Uchman	22		5C–D
2008	<i>Warvichnium ulbrichi</i>	Uchman <i>et al.</i>	220		7B
2009	<i>Warvichnium ulbrichi</i>	Uchman <i>et al.</i>	204		5C, 6E
2021	<i>Warvichnium ulbrichi</i> morphotype B	de Barros <i>et al.</i>	5, 8		3B, 4A

**Table S6.** List of occurrences of the ichnotaxon *Irichnus paripinnatus* isp. nov. Records from the Pašaminė sections (Lithuania), and Aquidauana Formation (Itararé Group, Paraná Basin – Brazil).

Year	Original description	Author(s)	Page(s)	Figure(s)
2009	<i>Warvichnium ulbrichi</i>	Uchman <i>et al.</i>	204	6B
2009	cf. <i>Warvichnium</i> isp.	Uchman <i>et al.</i>	205	6E
2021	<i>Warvichnium ulbrichi</i> morphotype A	de Barros <i>et al.</i>	8, 9	4F, 5A

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