Supplementary Text

Geological setting

The studied samples were collected in the lower part of the upper-Eifelian Skały Formation outcrop in the Holy Cross Mountains inlier (HCM, Central Poland).

The Skały outcrop is part of the well-known Grzegorzowice-Skały (G-S) succession exposed along the Dobruchna brook (Pajchlowa, 1957; Samsonowicz, 1936), which is a key section for the Devonian of the Łysogóry facies region (Szulczewski, 1995). The Miłoszów outcrop (Stasińska, 1958), located 3 km west of Skały, complements the key succession by virtue of the closely-correlated Miłoszów limestone complex (see fauna summary table in Biernat, 1966; Narkiewicz and Malec, 2005; Sansonowicz, 1936), which was recently exposed in Skały.

The Skały Formation (upper Eifelian–lower Givetian) represents epicratonic facies of the southern (so-called Fennosarmatian) tropical shelf of the Laurussia paleocontinent, an outcropping in close proximity to the East European Platform in the northern part (referred as the Łysogóry unit) of the HCM. The rocks were moderately tectonically deformed during the Variscan orogeny inside the Holy Cross Mountains Fold Belt (Konon, 2006), located in the north-eastern foreland of the Variscan orogen.

The Devonian of the Łysogóry region exposed in the G-S section was divided by Pajchlowa (1957) into the successive numbered lithostratigraphic units (I–XXVIII) used today in local stratigraphy. The middle-upper Devonian carbonate-bearing succession begins with the dolostones of the Wojciechowice Formation (unit IX), 250 m thick, deposited in the inner-carbonate-platform up to lagoon environment (Narkiewicz et al., 2015). The overlying, partly dolomitized limestone complex (units numbered X–XII), classified as a counterpart of the Kowala Formation (Narkiewicz and Narkiewicz, 2010; Narkiewicz et al., 1999), represents the tide-dominated carbonate platform interior (Łuczyński, 2008; Skompski and Szulczewski, 1994). The Wojciechowice-Kowala formation transition in the Łysogóry region contains conodonts of the *costatus* Zone (middle Eifelian) and is interpreted as the Id (Johnson et al., 1985), or *costatus*/*australis* transgressive event (Narkiewicz and Narkiewicz, 2010). The succeeding characteristic two-step deepening observed at the top of the Kowala Formation and at the base of the overlying Skały Formation was identified by Skompski and Szulczewski (1994; see also Narkiewicz and Narkiewicz, 2010) as a characteristic two-step Ie-If transgressive event (Johnson et al., 1985) occurring during the *kockelianus* Zone. The conodonts of this age are documented in the base (unit XIII) of the Skały Formation (Malec and Turnau, 1997). The lower part of the Skały Formation (units XIII to XIX) is coeval with the globally recognized, late Eifelian, oceanic Kačak event perturbations occurring after the Ie-If transgressive events (May, 1996; Talent et al., 1993), whereas the upper part of the formation, containing conodonts indicative of the *varcus* Zone (unit XX; Malec and Turnau, 1997), belongs to the lower Givetian.

The lower part of the Skały Formation contains a wide spectrum of facies in terms of lithology (clayey shales, marls, limestones) and fossil associations, representing varied paleoecologic and paleobathymetric conditions, from inner carbonate ramp to clay-marl fore-ramp environments, and from euphotic coral-crinoidal patch reefs to a fore-ramp muddy intrashelf basin (see main text Fig. 5).The rocks are famous for their very abundant, well-preserved benthic fauna, including brachiopods (Biernat, 1959, 1964; Narkiewicz and Malec, 2005), rugose corals (Fedorowski, 1965; Różkowska, 1958), tabulates (Narkiewicz et al., 1999), bryozoans (Kiepura, 1965), trilobites (Kielan, 1954), ostracods (Adamczak, 1976), and crinoids (Kiepura, 1965).

The samples Skały 0 and SkałyA+11A represent so-called brachiopod shales (unit XIV), known for the presence of a very abundant fauna assemblage, including easily extracted, well-preserved foraminifers (Duszyńska, 1956; Samsonowicz, 1936). The unit consists of marly mudstones with articulated *in situ* fossils (proximal fore-ramp setting), containing, in the top tabulate, an association of platy corals, interpreted by Zapalski et al. (Zapalski et al., 2017) as inhabiting calm, mesophotic (lower euphotic) environments.

The samples Miłoszów 11 and 12 represent two separate marly interlayers in "Miłoszów limestone" (Stasińska, 1958), which, judging by its very characteristic lithology (dark gray wackstones) and faunal assemblage, may be correlated with the middle part of unit XVII of the lower Skały Formation in the Skały section (see the fauna table summary in Samsonowicz, 1936, pp. 220–229; Narkiewicz and Malec, 2005, fig. 2). The Miłoszów limestones, in contrast to "brachiopod shales," are bioclastic to organogenic and contain massive forms of tabulates (*Alveolites taenioformis Schlüter*, *Coenites laminosa* Gürich, and *Favosites goldfussi* d´Orbigny; Biernat, 1966), stromatoporoids (Samsonowicz, 1936), large massive colonies of rugose corals (*Hexagonaria hexagona*, Biernat, 1966), numerous large specimens of trilobites (*Phacops (Geesops) schlotheimi skalensis*, Kielan, 1954, and *Scutellum flabelliferum* (*Goldfuss*); Kielan, 1954), as well as gastropods, crinoid detritus, and various other rugose corals. The characteristic feature of the Miłoszów exposure comprises vertical pockets with multiple occurrences of large disarticulate trilobite fragments, occurring between massive stromatoporoids and tabulates. The Miłoszów limestones represent a more turbulent (probably above the storm-wave base), upper euphotic (large, eyed trilobites *Geesops*), reef-like environment (presence of varied massive forms of sessile benthos and scutelluid trilobites recognized as common reef inhabitants in the Devonian; see Chlupač, 1993; Mikulic, 1981), interpreted here as patch reefs (biohermal limestones) and inter-patch-reef depressions (sampled marls).

The sample Skały C represents marls of the upper part of unit XVII of Pajchlowa (1957) and likely correlates with strata of the Miłoszów outcrop (recently unexposed) in the Skały section. The marls contain abundant rugose corals (numerous specimens of *Calceola sandalina*), crinoids, and pentamerid brachiopods and are interpreted here as a distal carbonate ramp setting, possibly localized between the patch reef shoals and the muddy fore-ramp basin environment (Fig. 5).

Tables

Table S1. Occurrence of *Semitextularia*.

Locality (Refernces)	Formation, Age	Lithology	Sedimentary environment
Miłoszów, Poland (our data)	Skały Formation, Miłoszów Limestone, upper Eifelian	marly intercalation between medium-layered fossiliferous wackestones to boundstones with trilobite lumachelle pockets; limestones contain abundant tabulates, stromatoporoids, brachiopods, solitary rugosan corals, phacopid and scutelluid trilobites	open-marine (stenohaline), carbonate ramp shoals: muddy substrate algal meadows between path-reefs, upper euphotic; low turbulent (based on lithology, facial context and faunal assemblage)
Skały, Poland (Duszyńska, 1956; our data)	Skały Formation, Dobruchna Brachiopod Shale Member, upper Eifelian	marls clayey shales with single thin limestone beds and platy tabulates coral horizons in the upper part; very abundant and diversified fossils of brachiopods, crinoids, small solitary corals, trilobites, ostracodes (Zapalski et al., 2017)	open-marine (stenohaline), fore-ramp, soft muddy substrate, low turbulent; lower euphotic - with mesophotic coral assemblage (Zapalski et al., 2017)
Marzysz, Poland (Racki and Soboń-Podgórska, 1993)	Kowala Formation, Jaźwica Member, uppermost Givetian,	marly intercalation in (below) medium-layered fossiliferous wackestones to packstones with shell- and crinoid-enriched partings and biostromal horizons with abundant rock-building solitary rugosan corals as well as eleutherozoan, microcornids, brachiopods, sponges, tabulates, ostracods, charophytes and other algae (e.g. Girvanella), placoderm remains, single scutelluid trilobites,gastropods, bryozoans and orthocone nautiloids (Racki, 1992)	semiprotected (between tabulates shoals), semi-restricted (possibly slightly brackish or fluctuating salinity), inner, sheltered part of carbonate platform; algal (charophyte bearing) meadows; upper euphotic, low-energetic regime; (based on: Racki, 1992; Racki and Soboń-Podgórska, 1993)
Wydryszów, Poland (Duszyńska, 1959; Fijałkowska-Mader and Malec, 2011)	Grzegorzowice Formation, Godów Marl Member, Upper Emsian	marls intercalations between limestones and dolomites with monospecific brachiopods at the base of the transgressive succession; marls contain abundant very diversified brachiopods, trilobites, crinoids, bryozoans, ostracodes,gastropods, bivalves, rostroconchs and rare corals (Czarnocki, 1950; Duszyńska, 1959)	nearshore, clastic influenced, muddy bottom, ?stenohaline, calm embayment; inside restricted, shallow, inner carbonate platform (based on lithology, facial context and faunal assemblage)
Čelechovice, Moravia, Czech Republic (Pokorny, 1951)	*Čelechovice* Beds, Red Coral marls; lower Givetian	grey to varicoloured fossiliferous calcareous mudstones with abundant non-reworked fossils [(corals, stromatoporoids, crinoids, brachiopods, ostracodes, gastropodes, bivalves, trilobites (numerous scutelluids)] rhythmically alternating by dark, shelly or skeletal, algal wackestone, packstones to floatstones, coquinas and lenticular biostromes (grey to violet coral bearing marlstones “Red Coral Beds”); The *Čelechovice* Beds occurs at the top of the transgressive succession of siliciclastic, dolomites with amphiporoids, and stromatoporoid biostromes (Chlupac, 1992)	nearshore, very shallow-water with moderate terrigenous influx, open-marine (stenohaline), euphotic, very calm environment sheltered from wave action by the coral-stromatoporoid reefs (Chlupac, 1992)
Maumke, Meggen, Sauerland, Rhenish Slate Mountains, Germany (Sobat, 1966)	Wissenbacher Schichten, Eifelian	marly limestone nodules horizon in dark gray calcareous silty gray to black slate to argillite with minor interbeds of sandstones; rich in fossils of brachiopods, bryozoans, crinoids, gastropods, epiplanktic bivalves, ostracodes, trilobites, nautiloids, goniatites, tentaculoids, and plant remains (Langenstrassen, 1972)	relatively shallow water, proximal offshore, open-shelf setting; clastic-dominated with temporal carbonate deposition (based on lithology, facial context and faunal assemblage)
1. Couvin, 2. Fromelennes, 3. Frasnes; Namur-Dinant Basin, Belgium (Mouravieff and Pultynck, 1966)	1. Eifelian, 2. Givetian, 3. Frasnian	acetic acid residues of: 1.-3. biostromal organogenic to argillaceous limestones with calcareous shale intercalations 1. gray-green argillaceous fossiliferous marly schists with limestone nodules and beds of argillaceous and crinoid limestones generally with abundant fauna of brachiopods, gastropods, bryozoans, trilobites, tabulates, calcispherids stromatoporoids and corals (Bykova, 1955); 2. bioclastic to crinoidal nodular argillaceous to marly limestones with abundant	1. terrigenous influenced, muddy-bottom, low turbulent to quiet environment; back-reef of crinoid-stromatoporoid-tabulate accumulations, lagoons and shoals with little path-reefs; open-marine to semirestricted environment (Mabille and Boulvain, 2007); 2. back-reef low turbulent to quiet with terrigenous influx, euphotic algal meadows (based

		brachiopods, numerous ostracodes, gastropods, crinoids, echinoids spines and sponges spicules, perireefal charophyta and Umbellidae, conodonts ; single tabulate corals, stromatoporoids, rugoses, trilobites, tentaculitids (Maillet et al., 2011)	on lithology, facial context and faunal assemblage)
Voronezh Region; Saratov Region, Ivanowo Region, Russia (Bykova, 1992)	1. Stary Oskol; upper Givetian; 2. Semiluki; middle Frasnian; 3. Petino; upper Frasnian; 4. Voronezh; upper Frasnian 5. Evlanov; upper Frasnian 6. Livny; upper Frasnian	Green-to dark grey, bituminous marly clays, marls, organodetritic to organogenic limestones (rare semitextularids), argillaceous limestones, algal limestones (6.); numerous erosive disconformities; diversified brachiopods forming clusters and coquinas, ostracodes, gastropods, bivalves, crinoids, lingulids, locally abundant land plant debris, locally rare corals; 3. marls with ligulids and plant remains forming intercalations in deltaic sandstones (Bykova, 1992; Rodionova et al., 1995)	extensive shallow-marine epeiric sea, semi-restricted, periodically stenohaline, strongly influenced by terrigenous and probably fresh-water input, vulnerable to periodical emersion; possibly dysoxic; clays and marls formed in low-energetic regime (3.) nearshore, calm, brackish environment; ?prodeltaic (based on lithology, facial context and faunal assemblage)
Kuznetsk Basin, Siberia, Russia (Timokhina and Rodina, 2015)	Glubokoe Formation Upper Frasnian	dark gray, organogenic–detrital, nodular limestones with onkolites, brachiopods, bryozoans, ostracods, rare solitary rugose corals	shallow marine, inner carbonate platform; low-turbulent, euphotic zone (based on lithology, facial context and faunal assemblage)
Hackberry Grove, Iowa, USA (Miller and Carmer, 1933)	Cerro Gordo member, Lime Creek Formation; upper Frasnian (Independence shale; Cushman and Stainbrook, 1943)	extremely fossiliferous calcareous shales with intervals of nodular shaly limestones, and bedded argillaceous limestones; diversified and abundant brachiopod fauna, green algae, algal reproductive structures (charophyte spores), sponges, stromatoporoids, tabulate corals, solitary and colonial rugose corals, bryozoans, bivalves, gastropods, cephalopods, tentaculites, calcareous worm tubes, scolecodonts, crinoids, echinoids, ostracodes, conodonts and fish (Groves et al., 2008)	open-marine, stenohaline, moderately shallow-water, euphotic, below storm-wave base, well-oxygenated settings; marginal (outer) zone of a broad carbonate-dominated inner shelf with transition to the more offshore dysoxic shale facies (Groves et al., 2008)
River Products Conklin Quarry; Klein Quarry (KQ); Eastern Iowa, USA (Kettenbrink and Toomey, 1975)	Coralville Member, Cedar Valley Formation, Upper Givetian	organodetritic calcarenites (locally biostromal) with hexagonarid and favositid corals, massive and ramose stromatoporoids, crinoids, and abundant algae: Girvanella Splzaeroporella Vermiporella Parachaetetes Radiosphaerid calcispheres, kamaenids; less abundant bryozoans and brachiopods	stenohaline to semi-restricted, euphotic, moderate depth, above storm wave base
East Bethany, Genesee Bay View, Erie Western New York, USA (Copeland and Kesling, 1955)	Ludlowville formation, Wanakah shale member; Centerfield limestone member; Givetian	light blue-gray to medium gray lange with several persistent more calcareous beds**,** exceptionally fossiliferous both in terms of number of species and abundance of individuals, corals, tabulates, bryozoan, brachiopods, bivalves, gastropods, cephalopods, tentaculites, crinoids, trilobites, ostracods	offshore, fore-ramp, open-marine (stenohaline), clastic-dominated with temporal carbonate deposition, soft muddy substrate, below storm wave base; possibly lower euphotic
Bear Beaumont-1 borehole, depth 1373-1383 ft.; Northeastern Alberta, Canada (Loranger, 1954)	(middle) Ireton Formation, Frasnian	calcareous gray-green shale with a few thin beds of fine-grained nodular limestone with charophyta, ostracodes, brachiopods (Olivers and Cowper, 1965)	Off-shore, open-marine, inter-reef basinal areas; (depressions) infiled by terrigenous clay mixed with fine carbonate material derived from the scattered reefs throughout the area (Olivers and Cowper, 1965)
Lyman Hills area, West-central Alaska, USA (Mamet and Plafker, 1982)	Frasnian	Algal-coral boundstone and packstone. Algal stromatoporoid boundstones and grainstones. Pelletoidal grainstone. algal wackestones. with corals, bivalves, stromatoporoids, calcisperids, algae (*Girvanella*)	very shallow open marine carbonate bank containing patch reef
Padaukpin, Maymyo, Shan States of Myanmar (Anderson et al., 1969)	Eifelian	calcareous mudstone and thin-bedded organodetritic to organogenic limestones with chiefly articulated fossils of corals (tetracorals and tabulates), stromatoporoids, brachiopods (high diversified brachiopods, crinoids, bryozoa, bivalves, gastropods, cephalopods, trilobites, annelids. ostracodes, sponges, tentaculites, echinoids; conodonts	moderately quiet-water, open marine environment assigned to Benthic Assemblage 3 (high-diversity Atrypa-Xystostrophia Community)

Koh-e Top, Afghanistan (Vachard and Massa, 1989)	Koh-e Giru Formation, Frasnian	layered, red and green shaly crinoidal limestone with spiriferid brachiopods	Shallow-water, open marine
Siewierz, Poland	Dziewki Limestone, Middle Givetian	gray, micritic, slightly bituminous Biostromal limestone with brachiopods, rugose corals and stromatoporoids	shallow and moderately calm sea

Table S2. *Semitextularia* test measurements

SKAŁY					**MIŁOSZÓW**				
Specimen number	**Sample number**	**Height** µm (prolocus –aperture)	**Width** µm (max)	**Area** µm² (HW/2)	**Specimen number**	**Sample number**	**Height** µm (proloculus - aperture)	**Width** µm (max)	**Area** µm² (HW/2)
9.26	0	449.8	479.9	107929.5	**9.02**	11R	468.1	344.5	80630.23
9.27	0	400.1	333.3	66676.67	**9.03**	11R	460.0	430.8	99084
9.28	0	398.3	359.0	71494.85	**9.04**	11R	521.1	518.5	135095.2
9.29	0	427.5	415.2	88749	**9.05**	11R	428.4	385.8	82638.36
9.30	0	388.1	283.6	55032.58	**9.06**	11R	462.9	359.7	83252.57
9.31	0	400.5	308.4	61757.1	**9.07**	11R	419.1	348.7	73070.09
9.32	0	459.2	447.8	102814.9	**9.08**	11R	519.1	460.7	119574.7
9.33	0	547.7	470.1	128736.9	**9.09**	11R	530.1	416.5	110393.3
9.34	0	346.7	351.1	60863.19	**9.10**	11R	520.9	408.5	106393.8
9.35	0	425.5	340.0	72335	**9.11**	11R	441.0	407.3	89809.65
9.36	0	438.8	442.7	97128.38	**9.12**	12R	514.1	435.6	111971
9.37	0	469.9	369.5	86814.03	**9.13**	12R	575.9	504.2	145184.4
9.38	0	482.5	482.8	116475.5	**9.14**	12R	514.7	412.5	106156.9
9.39	0	450.9	404.9	91284.71	**9.15**	12R	392.3	364.2	71437.83
9.40	0	339.1	321.4	54493.37	**9.16**	12R	474.0	500.2	118547.4
9.41	0	400.0	349.8	69960	**9.17**	12R	444.7	347.3	77222.16
9.42	1	432.0	389.8	84196.8	**9.18**	12R	439.3	347.4	76306.41
9.43	1	342.4	338.9	58019.68	**9.19**	11	433.4	426.6	92444.22
9.44	5	370.7	282.7	52398.45	**9.20**	11	479.3	410.2	98304.43
9.45	1	480.1	529.5	127106.5	**9.21**	11	611.5	488.0	149206
9.46	1	390.4	318.6	62190.72	**9.22**	11R	390.2	343.0	66919.3
9.47	1	364.0	361.7	65829.4	**9.23**	12R	415.1	310.9	64527.3
9.48	1	366.9	342.4	62813.28	**9.24**	12R	442.0	437.3	96643.3
9.49	1	337.1	310.5	52334.78	**9.25**	11R	415.0	459.1	95263.25
9.50	1	373.6	383.3	71600.44	**9.56**	12R	525.8	429.4	112889.3
9.51	1	463.8	473.1	109711.9	**9.57**	12R	380.5	383.2	72903.8
9.52	1	388.0	370.0	71780	**9.58**	12R	416.1	334.7	69634.34
9.53	1	377.7	350.7	66229.7	**9.59**	12R	332.1	312.0	51807.6
9.54	1	442.5	441.8	97748.25	**9.60**	12R	473.9	492.8	116769
9.55	1	405.2	362.7	73483.02	**9.61**	12R	360.7	359.0	64745.65

Table S3. Size differences between samples in test height, tested by ANOVA.

Test height

	SKAŁY 0	SKAŁY 1	MIŁOSZÓW 11R	MIŁOSZÓW 12R	MIŁOSZÓW 11
n	16	12	11	15	3
Mean	426.4	396.5	402.1	404.6	441.3
Std. error	12.9	13.6	16.4	17.4	23.8
Variance	2682.5	2205.4	2970.9	4526.5	1697.3
Stand. dev	51.8	47.0	54.5	67.3	41.2

Test for equal means (ANOVA)

	Sum of sqrs	df	Mean square	F	p (same)
Between groups:	10536.2	4	2634.1	0.851	0.4996
Within groups:	160972	52	3095.6		
Total:	171508	56	0.4999		

Pairwise comparisons (Duncan Test)

	SKAŁY 0	SKAŁY 1	MIŁOSZÓW 11R	MIŁOSZÓW 12R	MIŁOSZÓW 11
SKAŁY 0		0.090	0.214	0.957	0.658
SKAŁY 1	0.090		0.007	0.085	0.151
MIŁOSZÓW 11R	0.214	0.007		0.239	0.749
MIŁOSZÓW 12R	0.957	0.085	0.239		0.682
MIŁOSZÓW 11	0.658	0.151	0.749	0.682	

Table S4. Shape differences between samples in the growth independent ratios $width/height$ and $\sqrt{area/height}$, tested by ANOVA.

Test width/Test height

	SKAŁY 0	SKAŁY 1	MIŁOSZÓW 11R	MIŁOSZÓW 12R	MIŁOSZÓW 11
n	16	12	11	15	3
Mean	0.902	0.965	0.858	0.902	0.879
Std. error	0.025	0.021	0.024	0.030	0.055
Variance	0.010	0.005	0.007	0.013	0.009
Stand. dev	0.100	0.073	0.081	0.115	0.095

Test for equal means (ANOVA)

	Sum of sqrs	df	Mean square	F	p (same)
Between groups:	0.070	4	0.018	1.913	0.122
Within groups:	0.479	52	0.009		
Total:	0.549	56	0.122		

Pairwise comparisons (Duncan Test)

	SKAŁY 0	SKAŁY 1	MIŁOSZÓW 11R	MIŁOSZÓW 12R	MIŁOSZÓW 11
SKAŁY 0		0.090	0.214	0.957	0.658
SKAŁY 1	0.090		0.007	0.085	0.151
MIŁOSZÓW 11R	0.214	0.007		0.239	0.749
MIŁOSZÓW 12R	0.957	0.085	0.239		0.682
MIŁOSZÓW 11	0.658	0.151	0.749	0.682	

Square root (Test area)/Test height

	SKAŁY 0	SKAŁY 1	MIŁOSZÓW 11R	MIŁOSZÓW 12R	MIŁOSZÓW 11
n	16	12	11	15	3
Mean	0.768	0.781	0.753	0.762	0.778
Std. error	0.011	0.010	0.014	0.016	0.034
Variance	0.0020	0.0013	0.0022	0.0037	0.0034
Stand. dev	0.045	0.035	0.047	0.061	0.059

Test for equal means (ANOVA)

	Sum of sqrs	df	Mean square	F	p (same)
Between groups	0.005	4	0.001	0.5538	0.6971
Within groups	0.125	52	0.002		
Total	0.130	56	0.700		

Pairwise comparisons (Duncan Test)

	SKAŁY 0	SKAŁY 1	MIŁOSZÓW 11R	MIŁOSZÓW 12R	MIŁOSZÓW 11
SKAŁY 0		0.342	0.444	0.730	0.754
SKAŁY 1	0.342		0.113	0.209	0.797
MIŁOSZÓW 11R	0.444	0.113		0.659	0.446
MIŁOSZÓW 12R	0.730	0.209	0.659		0.611
MIŁOSZÓW 11	0.754	0.797	0.446	0.611	

Table S5. The isotopic data ($\delta^{13}C$ and $\delta^{18}O$) of benthic foraminifera *Semitextularia* and bulk rock samples from Miłoszów; (A) stratigraphic interval. (B) type of studied material. (C) sample number.

A	B	C	$\delta^{13}C$ values V-PBD	$\delta^{18}O$ values V-PBD
MIŁOSZÓW 11	FOAMINIFERA	S.46	2.85	-6.77
		S.47	3.07	-6.60
		S. 48	3.06	-6.60
		S. 49	3.84	-6.32
		S.50	3.10	-6.97
		S.63	2.90	-5.79
		S.8	1.21	-5.42
		Mean	**2.86**	**-6.35**
	BULK ROCK	S.9	-0.33	-6.47
		S.26	0.65	-6.28
		S.27	-0.22	-6.77
		S.28	0.23	-6.67
		S.29	-0.31	-6.77
		S.9’	-0.33	-6.74
		Mean	**-0.05**	**-6.66**
MIŁOSZÓW 12	FORAMINIFERA	S.51	2.83	-6.44
		S.52	2.84	-6.51
		S.53	2.50	-6.44
		S.54	2.44	-6.34
		S.11	2.90	-6.43
		S.64	2.73	-6.49
		Mean	**2.71**	**-6.44**
	BULK ROCK	S.12	-2.73	-7.33
		S.30	-1.35	-6.63
		S.31	-1.72	-6.60
		S.32	-2.61	-6.73
		S.33	-2.80	-7.25
		Mean	**-2.24**	**-6.91**

Table S6. The isotopic data ($\delta^{13}C$ and $\delta^{18}O$) of benthic foraminifera *Semitextularia* and bulk rock samples from Skały; (A) stratigraphic interval. (B) type of studied material. (C) sample number.

A	B	C	$\delta^{13}C$ values V-PBD	$\delta^{18}O$ values V-PBD
SKAŁY 11	FORAMINIFERA	S.59	1.47	-5.98
		S.60	1.40	-5.98
		S.61	1.49	-5.86
		S.62	1.49	-5.92
		S.1	1.48	-6.00
		Mean	1.46	-5.95
	BULK ROCK	S.2	1.76	-5.49
		S.14	1.77	-5.61
		S.15	1.69	-5.50
		S.16	1.71	-5.55
		S.17	1.63	-5.65
		Mean	1.71	-5.56
SKAŁY A+11A	FORAMINIF.	S.65	0.92	-5.54
		S.4	0.76	-5.44
		Mean	0.84	-5.49
	BULK ROCK	S.18	0.13	-6.12
		S.19	0.10	-6.17
		S.20	0.15	-6.09
		S.21	0.12	-6.19
		S.5	0.00	-6.28
		Mean	0.10	-6.17
SKAŁY C	FORAMINI-FERA	S.6	1.31	-5.59
		S.55	1.02	-5.43
		S.56	0.98	-5.39
		S.57	1.44	-5.51
		S.58	3.27	-6.49
		Mean	1.60	-5.68
	BULK ROCK	S.7	0.95	-5.49
		S.22	0.94	-5.48
		S.23	1.05	-5.28
		S.24	0.81	-5.53
		S.25	1.04	-5.38
		Mean	0.96	-5.43

Table S7. Differences between *Semitextularia* and bulk rock samples for $\delta^{13}C$ and $\delta^{18}O$ values checked by Student-t tests.

MIŁOSZÓW 11

$\delta^{13}C$ Forams		$\delta^{13}C$ bulk rock	
Mean	**2.861**	Mean	**-0.052**
Variance	0.638	Variance	0.164
F	3.881	p (same var.)	*0.158*
t	8.055	p (same mean)	6.12E-06
Uneq. var. t	8.463	p (same mean)	1.26E-05

$\delta^{18}O$ Forams		$\delta^{18}O$ bulk rock	
Mean	**-6.353**	Mean	**-6.617**
Variance	0.311	Variance	0.040
F	7.774	p (same var.)	***0.040***
t	1.094	p (same mean)	0.297
Uneq. var. t	1.167	p (same mean)	0.278

MIŁOSZÓW 12

$\delta^{13}C$ Forams		$\delta^{13}C$ bulk rock	
Mean	**2.707**	Mean	**-0.052**
Variance	0.037	Variance	0.164
F	4.448	p (same var.)	*0.127*
t	15.060	p (same mean)	3.37E-08
Uneq. var. t	15.060	p (same mean)	1.14E-06

$\delta^{18}O$ Forams		$\delta^{18}O$ bulk rock	
Mean	**-6.442**	Mean	**-6.908**
Variance	0.003	Variance	0.125
F	35.668	p (same var.)	*0.001*
t	3.215	p (same mean)	0.011
Uneq. var. t	2.919	p (same mean)	0.041

SKAŁY 11

$\delta^{13}C$ Forams		$\delta^{13}C$ bulk rock	
Mean	**1.466**	Mean:	**1.712**
Variance	0.001	Variance:	0.003
F	2.25	p (same var.):	*0.451*
t	8.067	p (same mean):	4.11E-05
Uneq. var. t	8.067	p (same mean):	8.86E-05

$\delta^{18}O$ Forams		$\delta^{18}O$ bulk rock	
Mean	**-5.948**	Mean:	**-5.560**
Variance	0.003	Variance:	0.005
F	1.45	p (same var.):	*0.730*
t	9.628	p (same mean):	1.13E-05
Uneq. var. t	9.628	p (same mean):	1.41E-05

SKAŁY A+11A

$\delta^{13}C$ Forams		$\delta^{13}C$ bulk rock	
Mean	**0.840**	Mean:	**1.712**
Variance	0.006	Variance:	0.003
F	1.99	p (same var.):	*0.503*
t	18.251	p (same mean):	1.74E-06
Uneq. var. t	16.546	p (same mean):	3.05E-04

$\delta^{18}O$ Forams		$\delta^{18}O$ bulk rock	
Mean	**-5.490**	Mean:	**0.100**
Variance	0.003	Variance:	0.003
F	1.38	p (same var.):	*0.922*
t	136.740	p (same mean):	1.03E-11
Uneq. var. t	143.220	p (same mean):	3.43E-10

SKAŁY C

$\delta^{13}C$ Forams		$\delta^{13}C$ bulk rock	
Mean	**1.604**	Mean:	**0.958**
Variance	0.905	Variance:	0.009
F	96.57	p (same var.):	*6.26E-04*
t	1.511	p (same mean):	0.169
Uneq. var. t	1.511	p (same mean):	0.204

$\delta^{18}O$ Forams		$\delta^{18}O$ bulk rock	
Mean	**-5.682**	Mean:	**-5.432**
Variance	0.210	Variance:	0.010
F	20.44	p (same var.):	*0.013*
t	1.191	p (same mean):	0.268
Uneq. var. t	1.191	p (same mean):	0.294

References

Adamczak, F.: Middle Devonian Podocopida (Ostracoda) from Poland; their morphology, systematics and occurrence, Senckenbergiana lethaea, 57, 265–467, 1976.
Anderson, M. M., Boucot, A. J., and Johnson, J. G.: Eifelian brachiopods from Padaukpin, northern Shan states, Burma: Bulletin of the British Museum , 18, 105-163, 1969.
Biernat, G.: Middle Devonian Orthoidea of the Holy Cross Mountains and their ontogeny, Acta Palaeontol. Pol., 10, 1–78, 1959.
Biernat, G.: Middle Devonian Atrypacea (Brachiopoda) from the Holy Cross Mountains, Poland, Acta Palaeontol. Pol., 9(3), 277-340, 1964.
Biernat, G.: Middle Devonian brachiopods from the Bodzentyn Syncline (Holy Cross Mountains, Poland), Acta Palaeontol. Pol., 17, 1–162, 1966.
Bykova, E. V.: Foraminifery devona Russkoj platformy i Priuralia (in Russian), Mikrofauna CCCP, 5, 5-64, 1952.
Bykova, E. V.: Devonian foraminifera and radiolaria of the Volga-Ural district and central Devonian field, and their significance for stratigraphy (in Russian), Trudy VNIGRI, 87, 5-190, 1955.
Chlupác, I.: Middle Devonian trilobites from Celechovice in Moravia (Czechoslovakia), Sbornik geologickych ved, Paleontologie, 32, 123-161, 1992.
Chlupáč, I.: Trilobites from the Givetian and Frasnian of the Holy Cross Mountains, Acta Palaeontol. Pol. , 37, 395–406, 1993.
Copeland, M. J. and Kesling, R. V.: A new occurrence of Semitextularia thomasi (Miller and Carmer, 1933), Contributions from the Museum of Paleontology, University of Michigan, 12, 105-112, 1955.
Cushman, J. A. and Stainbrook, M. A.: Some Foraminifera from the Devonian of Iowa, Contrib. Cushman Lab. Foram. Res., 19, 73-79, 1943.
Czarnocki, J.: Geology of the Łysa Góra region (Holy Cross Mountains) in the connection with the problem of iron ores at Rudki [in Polish with English summary], Prace Państwowego Instytutu Geologicznego, 18, 1–308, 1950.
Duszyńska, S.: Foraminifers from the Middle Devonian of the Holy Cross Mountains, Acta Palaeontol. Pol., 1, 23-34, 1956.
Duszyńska, S.: Devonian Foraminifers from Wydryszów (Holy Cross Mountains), Acta Palaeontol. Pol., 4, 71-89, 1959.
Fedorowski, J.: Lindstroemiidae and Amplexocariniidae (Tetracoralla) from the Middle Devonian of Skały, Holy Cross Mountains, Poland, Acta Palaeontol. Pol., 10(3), 335-364, 1965.
Fijałkowska-Mader, A. and Malec, J.: Biostratigraphy of the Emsian to Eifelian in the Holy Cross Mountains (Poland), Geological Quarterly, v. 55, p. 109–138, 2011.
Groves, J. R., Walters, J. C, and Day, J.: Carbonate platform facies and faunas of the Middle and Upper Devonian Cedar Valley Group and Lime Creek Formation, northern Iowa, Iowa Geological Survey Guidebook, 28, 96, 2008.
Johnson, J. G. Klapper, G., and Sandberg, C.A.: Devonian eustatic fluctuations in Euramerica, Geological Society of America Bulletin, 96(5), 567-587, 1985.
Kettenbrink, E. C. and Toomey, D. F.: Distribution and paleoecological implications of calcareous foraminifera in the Devonian Cedar Valley Formation of Iowa, J. Foram. Res., 5, 176-187, 1975.
Kielan, Z.: Les trilobites mésodévoniens des monts de Sainte-Croix, Acta Palaeontol. Pol., 6, 1–50, 1954.
Kiepura, M.: Devonian bryozoans of the Holy Cross Mountains, Poland. Part I. Ctenostomata: Acta Palaeontol. Pol., 10(1), 11-56, 1965.
Konon, A.: Buckle folding in the Kielce Unit, Holy Cross Mountains, central Poland, Acta Geol. Pol., 56, 375–405, 2006.
Langenstrassen, F.: Fazies und Stratigraphie der Eifel-Stufe im östlichen Sauerland:(Rheinisches Schiefergebirge, Bl. Schmallenberg und Girkhausen), Geologisch-Paläontologisches Institut der Georg-August-Universität, 12, 1972.
Loranger, D. M.: Ireton Microfossil Zones of Central and Northeastern Alberta: Stratigraphy, The American Association of Petroleum Geologists Bulletin, 182-203, 1954.
Łuczyński, P.: Growth forms and distribution patterns of stromatoporoids exposed on Devonian palaeobottom surfaces; Holy Cross Mountains, central Poland, Acta Geol. Pol., 58, 303-320, 2008.

Mabille, C. and Boulvain, F.: Sedimentology and magnetic susceptibility of the Couvin Formation (Eifelian, south western Belgium): carbonate platform initiation in a hostile world, Geologica Belgica, 10, 47-67, 2007.
Maillet, S., Milhau, B., and Pinte, E.: The Fromelennes Formation in the type-area (Fromelennes, Ardennes, France), Annales de la Société géologique du Nord, 18, 9-34, 2011.
Malec, J. and Turnau, E.: Middle Devonian conodont, ostracod and miospore stratigraphy of the Grzegorzowice-Skały section, Holy Cross Mountains, Poland, Bulletin of the Polish Academy of Sciences, Earth Sciences, 45, 67-86, 1997.
Mamet, B. L. and Plafker, G. A.: Late Devonian (Frasnian) Microbiota from the Farewell-Lyman Hills Area, West-Central Alaska, U.S. Geological Survey Professional Paper, 1216, 1-12, 1982.
May, A.: Relationship among sea-level fluctuation, biogeography, and bioevents of the Devonian: an attempt to approach a powerful, but simple model for complex long-range control of biotic crises, Geolines, 3, 38-49, 1996.
Mikulic, D. G.: Trilobites in Paleozoic carbonate buildups, Lethaia, 14, 45-56, 1981.
Miller, A. K. and Carmer, A. M.: Devonian Foraminifera from Iowa, J. Paleontol., 7, 423-431, 1933.
Mouravieff, N. and Pultynck, P.: Quelques Foraminifères du Couvinien et du Frasnien du bord sud du bassin de Dinant, Bulletin de la Société belge de Géologie, 75, 153–156, 1966.
Narkiewicz, K. and Narkiewicz, M.: Mid Devonian carbonate platform development in the Holy Cross Mts. area (central Poland): new constraints from the conodont Bipennatus fauna, Neues Jahrb. Geol. Paläontol., 255(3), 287-300, 2010.
Narkiewicz, M., Racki, G., and Wrzołek, T.: Lithostratigraphy of the Devonian stromatoporoid-coral carbonate sequence in the Holy Cross Mountains, Kwartalnik Geologiczny, 34(3), 433-456, 1999.
Narkiewicz, M., Grabowski, J., Narkiewicz, K., Niedzwiedzki, G., and Rettallack, G. J.: Palaeonvironments of the Eifelian dolomites with earliest tetrapod trackways (Holy Cross Mountains, Poland), Palaeogeogr., Palaeoclimatol., Palaeoecol., 420, 173-192, 2015.
Olivers, T. and Cowper, N. W.: Depositional environments of Ireton Formation, central Alberta, Am. Assoc. Pet. Geol. Bull., 49, 1410-1425, 1965.
Pajchlowa, M.: Dewon w profilu Grzegorzowice-Skały (in Polish with English summary), Biuletyn Instytutu Geologicznego, 122, 145-254, 1957.
Pokorny, V.:The Middle Devonian foraminifera of Celechovice, Czechoslovakia, Věstník Královské České Společnosti Nauk. Třida matematicko-přírodovědecké, 9, 1–29, 1951.
Racki, G.: Evolution of the bank to reef complex in the Devonian of the Holy Cross Mountains, Acta Palaeontol. Pol., 37(2-4), 87-182, 1992.
Racki, G. and Soboń-Podgórska, J.: Givetian and Frasnian calcareous microbiotas of the Holy Cross Mountains, Acta Palaeontol. Pol., 37, 255-289, 1993.
Rodionova, G. D., Umnova, V. T., Kononova, L. I., Ovnatanova, N. S., and Rzhonsnitskaya, M. A.: Devonian of the Voronezh Anticline and Moscow Syncline: Moscow, p. 265, 1995.
Różkowska, M.:. Pachyphyllinae from the Middle Devonian of the Holy Cross Mountains. Part I, Acta Palaeontol. Pol., 1(4), 271-330, 1958.
Samsonowicz, J.: Sprawozdanie z badań w r. 1935 na północ od kopalni Staszic między Pokrzywianką, Psarką i Swiśliną (in Polish), Posiedzenie naukowe Państwowego Instytutu Geologicznego, 44, 41-45, 1936.
Skompski, S. and Szulczewski, M.:Tide-dominated Middle Devonian sequence from the northern part of the Holy Cross Mountains (Central Poland), Facies, 30(1), 247-265, 1994.
Sobat, M. R., Semitextularia thomasi Miller & Carmer (Foram.) aus dem Wissenbacher Schiefer (Eifel-Stufe) von Meggen im Sauerland (Rheinisches Schiefergebirge), Palaontologische zeitschrif, 40, 237–243, 1966.
Stasińska, A.: Tabulata, Heliolitida et Chaetetida du Devonien moyen des monts de Sainte-Croix, Acta Palaeontol. Pol., 3(3-4), 161-282, 1958.
Szulczewski, M.: Depositional evolution of the Holy Cross Mts. (Poland) in the Devonian and Carboniferous – a review, Geological Quarterly, 39, 471-488, 1995.
Talent, J. A., Mawson, R., Andrew, A. S., Hamilton, P. J., and Whitford, D. J.: Middle Palaeozoic extinction events: faunal and isotopic data, Palaeogeogr., Palaeoclimatol., Palaeoecol., 104(1-4), 139-152, 1993.

Timokhina, I. G. and Rodina, O. A.: New Data on Upper Devonian Stratigraphy of the Northwestern Kuznetsk Basin: Evidence from Foraminifera and Chondrichthyes, Stratigr. Geol. Correl., 23, 495-516, 2015.
Vachard, D. and Massa, D.: Apparition précoce du genre Nanicella (Foraminifère) dans le Dévonien inférieur du Sud-Tunisien, Bulletin de la Société belge de géologie, 98, 287-293, 1989.
Zapalski, M. K., Wrzołek, T., Skompski, S., and Berkowski, B.: Deep in shadows, deep in time: the oldest mesophotic coral ecosystems from the Devonian of the Holy Cross Mountains (Poland), Coral Reefs, 36(3), 847-860, 2017.
Zeuschner, L.: Geognostische Beschreibung der mittleren devonischen Schichten zwischen Grzegorzowice und Skaly-Zagaje bei Nowa Slupia, Zeitschrift der Deutschen Geologischen Gesselschaft, 21, 263-274, 1869.