

The Stipinai Regional stage (Upper Devonian) in Petrašiūnai quarry

Giedrius Bičkauskas,

Sigitas Radzevičius

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J. Dalinkevičius was the first to establish the Stipinai Regional stage in 1939. The name is after the Stipinai Village located in the northern Lithuania. The stratotype is in the Mūša River outcrop between Petrašiūnai and Svobiškės villages. The Petrašiūnai quarry is in the Petrašiūnai Village, which belongs to the Pakruojis District. The Stipinai Regional stage is cropping out in some parts of the quarry and its thickness varies from 3 to 9 m. Production of dolostone in the Petrašiūnai quarry started in 1959. The largest amounts of dolostone were excavated in 2008.

Key words: Devonian, Petrašiūnai quarry, dolostone production

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Giedrius Bičkauskas, Sigitas Radzevičius. Department of Geology and Mineralogy, Vilnius University, M. K. Čiurlionio 21/27, LT-03101 Vilnius, Lithuania. E-mail: giedrius.bickauskas@gf.vu.lt; sigitas.radzevicius@gf.vu.lt

INTRODUCTION

Devonian rocks are abundant in the territory of Lithuania. Two zones are defined: West and East from a structural and tectonic point of view (Paškevičius, 1997). In the West zone the Devonian succession is the most complete: from the Lochkovian to the Famennian age. Rock thickness in the West zone is up to 600 m. In the East zone the succession is from the Lochkovian to the Frasnian stage.

J. Dalinkevičius was the first to establish the Stipinai Regional stage in 1939. The name is after the Stipinai Village located in the northern Lithuania. The stratotype is in the Mūša River outcrop between Petrašiūnai and Svobiškės villages. The thickness of the Stipinai Regional stage rocks is up to 13 m (Sidaravičienė et al., 1999). The Stipinai formation is defined in this regional stage which is of the Late Frasnian age (Fig. 1). There is the *Theodossia samgalensis* brachiopod assemblage distinguished in the Stipinai regional stage (Žeiba, 2004).

The Petrašiūnai quarry is in the Petrašiūnai Village, which belongs to the Pakruojis District (Fig. 2). Full succession of the Stipinai Regional stage is cropping out in some parts of the quarry. The thickness of Devonian rocks varies from 3 to 9 m. Devonian rocks are covered by Quaternary deposits.

PETRAŠIŪNAI QUARRY

Lithological description of the Petrašiūnai quarry wall (Fig. 3):

I. **0–0.3 m.** Sandy soil, organic rich, somewhere almost peat. Black grey.

II. **0.3–3.0 m.** Sandy and clayey till with gravel, pebble and boulders. Brown and reddish brown. Massive structure. Very intensive reaction with hydrochloric acid.

III. **3.0–6.0 m.** Dolostone. Horizontally bedded. Greyish brown, clayey. With caverns up to 2–3 cm in diameter. The caverns take up to 5% of the total rock volume. Some caverns are partly filled with calcite crystals. Hard.

System	Series	Stages	Conodont biozones	Regional stages	Formations
Devonian	Upper	Famennian	<i>S. costatus</i>	Škervelė	Škervelė
				Ketleri	Ketleri
			<i>R. styricus</i>	Žagarė	Žagarė
			<i>S. velifer</i>	Švėtė	Švėtė
			<i>P. marginifera</i>	Mūri	Mūri
				Akmenė	Akmena
		Frasnian	<i>P. rhomboidea</i>	Kuršiai	Kuršiai
			<i>P. crepida</i>	Joniškis	Joniškis
			<i>P. triangularis</i>	Šiauliai	Šiauliai
				Kruoja	Kruoja
			<i>P. gigas</i>	Amulė	Pakruojis
				Stipinai	Stipinai
				Pamūšis	Pamūšis
				Katleši	Istras
			<i>A. triangularis</i>	Daugava	Tatula
			<i>P. asymmetricus</i>	Dubnik	Kupiškis
				Plavinas	Suosa Jara

Fig. 1. The Upper Devonian stratigraphy of Lithuania (Narbutas, Valiukevičius, Žeiba, 1993; Tānavsū-Milkevičienė, Plink-Björklund, 2009)

1 pav. Lietuvos viršutinio devono stratigrafinė schema (Narbutas, Valiukevičius, Žeiba, 1993; Tānavsū-Milkevičienė, Plink-Björklund, 2009)

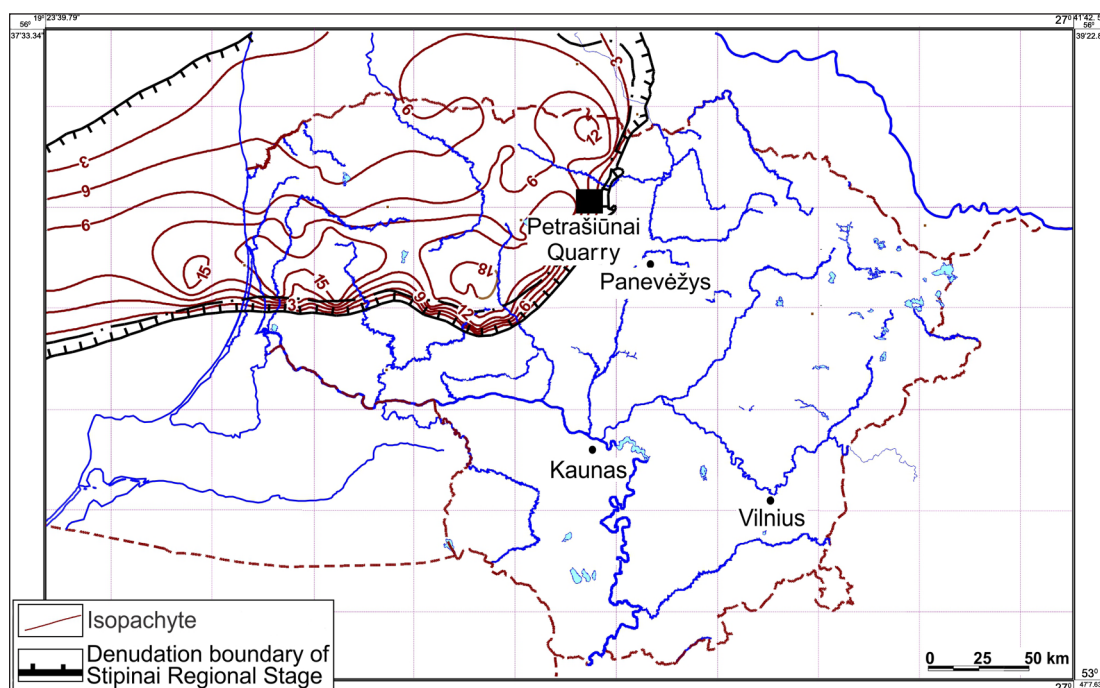


Fig. 2. The distribution map of Stipinai Regional Stage rocks in Lithuania (Narbutas, 2005).

1 – isopachyte; 2 – denudation boundary of Stipinai Regional Stage

2 pav. Stipinų regioninio aukšto uolienų paplitimas Lietuvoje (Narbutas, 2005). 1 – izopachitos; 2 – tipinų regioninio aukšto denudacinė riba

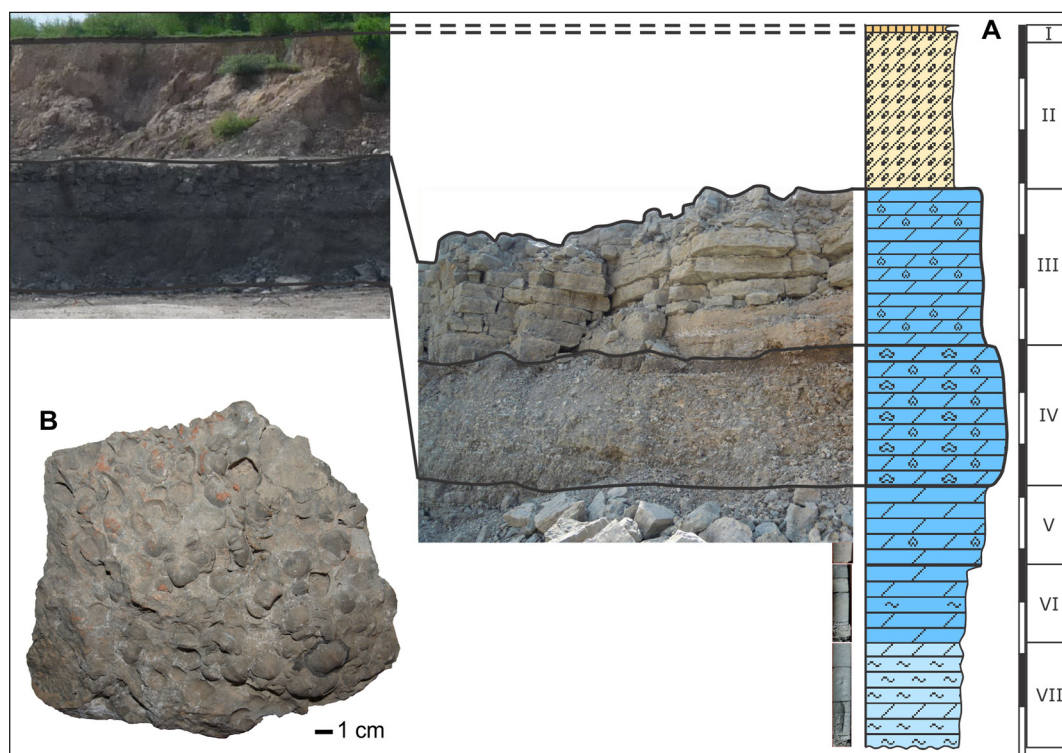


Fig. 3. A – The section of the Petrašiūnai quarry wall (see text for explanation). B – *Theodossia semgalensis* (Delle), Petrašiūnai quarry, Stipinai formation, Frasnian, Upper Devonian

3 pav. A – Petrašiūnų karjero sienos pjūvis (paaiškinimą žiūrėti tekste). B – *Theodossia semgalensis* (Delle), Petrašiūnų karjeras, Stipinų svita, franis, viršutinis devonas

IV. **6.0–8.5 m.** Dolostone. Unclearly horizontally bedded. Greenish grey. Abundant caverns: variation in diameter from few to 10 cm. The caverns take up to 15% of the total rock volume. Some caverns are partly filled with calcite crystals; some calcite crystals are covered by a film of iron rich minerals while the others are partly filled with pyrite crystals. Very hard. Tetra corals and brachiopods shells are present. The pores of rock are of a mouldic type. In the upper contact zone ferrous clay material in the pores and caverns gives a brown colour to the rocks.

V. **8.5–10.0 m.** Dolostone. Pale yellowish brown. The structure is massive and horizontally bedded. The thickness of the layers is about 0.3 cm. The bedding is determined by different intensity of a brown and greenish grey colour. Rare caverns which take up to 1% of the total rock volume. There are concretions of pyrite in the upper part.

VI. **10.0–11.5 m.** Dolostone. Greenish grey. The structure is massive. Rare concretions of pyrite. In the lower part intercalated with marl.

VII. **11.5–13.5 m.** Marlstone dolomitic. Dark greenish grey. The structure is massive. In the upper part intercalated with dolostone.

Production of dolostone in the quarry started in 1959. Currently the quarry is operated by AB Dolomitas. The company was established in 1995 after privatization of the Petrašiūnai manufactory. Dolostone is one of the main mineral resources of rocks next to peat, sand, gravel, limestone and clay which are being quarried in Lithuania. The quarrying depends on the demand (Fig. 4). Since the beginning of 2009 the resources of dolostone in Lithuania were estimated 306 million m³. The preliminary tentatively prospective resources are 141 million m³ while detail prospective resources are 107 million m³.

AB Dolomitas is making all grain-size fractions of broken dolostone, which pass European standards. The broken dolostone is used for road construction, making asphalt concrete, ferroconcrete blocks, concrete and mineral wool.

A large part of production is for domestic use. In 1994 and from 2006 to 2008 a substantial part

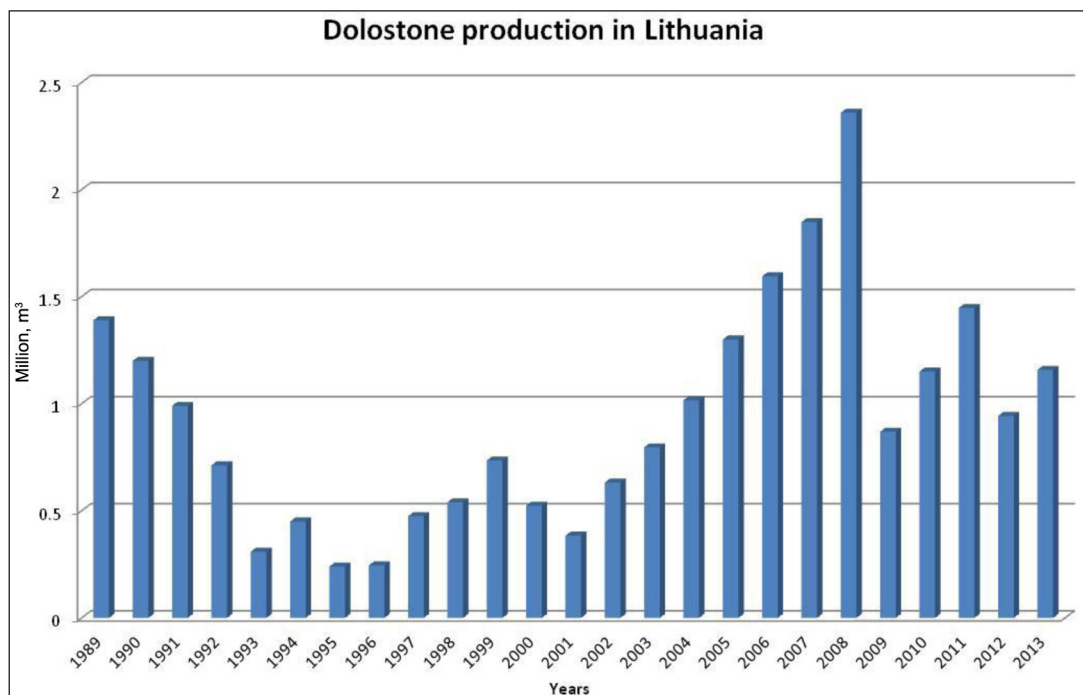


Fig. 4. Dolostone production chart in Lithuania during 1989–2013

4 pav. Dolomito kasyba Lietuvoje 1989–2013 metais

was exported to Latvia. The company is currently searching for the markets in Germany, Poland and other countries.

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Giedrius Bičkauskas, Sigita Radzevičius

STIPINŲ REGIONINIS AUKŠTAS (VIRŠUTINIS DEVONAS) PETRAŠIŪNŲ KARJERE

Santrauka

Stipinų regioninis aukštas pirmą kartą Lietuvoje buvo išskirtas J. Dalinkevičiaus (1939). Regioninio aukšto pavadinimas yra kilęs nuo Stipinų kaimo šiaurės Lietuvoje. Stratotipinis pjūvis yra Mušos upės atodangose tarp Petrašiūnų ir Svobiškio kaimų. Petrašiūnų karjere, kuris Petrašiūnų kaime, Pakruojo rajone, Stipinų svitos storis svyruoja nuo 3 iki 9 metrų. Dolomitas Petrašiūnų karjere buvo pradėtas kasti 1959 metais. Didžiausi dolomito kiekiai buvo iškasti 2008 metais.

Raktažodžiai: devonas, Petrašiūnų karjeras, dolomito kasyba