

- 1 Pavel Gol'din ¹
- 2 Bogdan - Stelian Haiduc ²
- 3 Oleksandr Kovalchuk ^{3,4}
- 4 Marcin Górka ⁵
- 5 Pavlo Otryazhyi ⁶
- 6 Mihai Brânzilă ²
- 7 Elena - Ionela Păun ²
- 8 Zoltán Barkaszi ³
- 9 Paul Țibuleac ²
- 10 Bogdan Gabriel Rățoi ^{2,*}
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- 13 The Volhynian (late Middle Miocene) marine fishes and mammals as proxies for the onset of the
- 14 Eastern Paratethys re-colonisation by vertebrate fauna
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SUPPLEMENTARY MATERIAL

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29 Table S1. Age summary of the studied localities

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Early Volhynian	Late Volhynian	Volhynian (non-stratified)
Kolubaiivtsi, Khonkivtsi, Stăuceni, Darabani, Cordăreni, Mitoc-Prut, Hănești, Săveni-Ghireni, Drăgușeni, Karpov Yar (Naslavcea)	Dealul Nucului (Leucușești), Stâncești, Basarabi and Pâraul lui Gheorghe, Voinești, Erbiceni, Aroneanu, Românești, Brykiv, Saur-Mohyla	Hrushivtsi, Vilkhovets, Khotin

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33 Table S2. Marine vertebrate records from the Volhynian of the Eastern Paratethys (western
 34 and northern part) by taxon, locality and age.

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Taxon (as identified by this study)	Previous identification (nomenclatural notes)	Locality	Approximate geographical coordinates	Age	References
Actinopterygii					
<i>Sarmatella doljeana</i>		Leucușești	47°25' N 26°22' E	Late Volhynian	This study
	<i>Clupeonella delicatula</i>	Hrushivtsi	48°32' N 26°49' E	Volhynian	This study; Tatarinov, 2000
Clupeinae indet.	<i>Clupea</i> sp.	Voinești	47° 4' N 27°26' E	Late Volhynian	This study; Macarovici, 1970
	<i>Sardinella sardinites</i>	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	Clupeidae indet.	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	“ <i>Prolebias</i> ” sp.	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	<i>Atherina suchovi</i>	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	Syngnathidae indet.	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	<i>Lates gregarius</i>	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	<i>Morone ionkoi</i>	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
<i>Sparus brusinai</i>	<i>Serranus</i> sp.	Hrushivtsi	48°32' N 26°49' E	Volhynian	This study; Tatarinov, 2000
	<i>Sparus brusinai</i>	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
<i>Sparus cf. brusinai</i>		Basarabi	47°27' N 26°24' E	Late Volhynian	This study
	<i>Naslavcea fundata</i>	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	<i>Mullus moldavicus</i>	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	<i>Polydactylus frivolus</i>	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	<i>Mugil acer</i>	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	<i>Symphodus salvus</i>	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009

	<i>Clinitrachoides gratus</i>	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	<i>Pomatoschistus</i> sp.	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	<i>Gobius</i> sp.	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
	<i>Mesogobius</i> sp.	Hrushivtsi	48°32' N 26°49' E	Volhynian	Tatarinov, 2000
	<i>Cottus</i> sp.	Hrushivtsi	48°32' N 26°49' E	Volhynian	Tatarinov, 2000
Scombroidei indet.		Kolubaivtsi	48°44'N, 26°39'E	Early Volhynian	This study
	<i>Caranx</i> sp.	Aroneanu	47°11' N 27°35' E	Late Volhynian	Macarovici, 1970
	<i>Caranx</i> sp.	Erbiceni	47°15' N 27°14' E	Late Volhynian	Macarovici, 1970
<i>Bothus parvulus</i>	<i>Caprovesposus</i> sp.	Românești	47°16' N 27°18' E	Late Volhynian	This study; Macarovici, 1970
	Pleuronectiformes indet.	Naslavcea	48°28' N 27°34' E	Early Volhynian	Bannikov, 2009
Mammalia					
Phocinae indet. 1		Kolubaivtsi	48°44'N, 26°39'E	Early Volhynian	This study
Phocinae indet. 2		Stăuceni	47°43' N 26°44' E	Early Volhynian	This study
<i>Kentriodon fuchsii</i>		Stăuceni	47°43' N 26°44' E	Early Volhynian	This study
		Basarabi	47°27' N 26°24' E	Late Volhynian	This study
		Stâncești	47°44' N 26°35' E	Late Volhynian	This study
	<i>Champsodelphis</i> cf. <i>fuchsii</i>	Ghireni	48° 9' N 26°53' E	Early Volhynian	This study; Macarovici, Zaharia, 1967; Ionesi, Galan, 1988
	<i>Champsodelphis</i> cf. <i>fuchsii</i>	Cordăreni	47°59' N 26°35' E	Early Volhynian	This study; Macarovici, Zaharia, 1967; Ionesi, Galan, 1988
Kentriodontidae indet. 1 (cf. <i>Imerodelphis thabagarii</i>)		Saur-Mohyla	47°55' N 38°44' E	Late Volhynian	This study
	<i>Phocaena euxinica</i>	Stâncești	47°44' N 26°35' E	Late Volhynian	This study; Macarovici, Zaharia, 1967
? Kentriodontidae indet. 2		Stăuceni	47°43' N 26°44' E	Early Volhynian	This study
		Stâncești	47°44' N 26°35' E	Late Volhynian	This study

	<i>Microphocaena podolica</i>	Brykiv	50°35' N 27°1' E	Late Volhynian	This study
? Kentriodontidae indet. 3		Stăuceni	47°43' N 26°44' E	Early Volhynian	This study
		Saur-Mohyla	47°55' N 38°44' E	Late Volhynian	This study
		Mitoc-Prut	48°6' N 27°1' E	Early Volhynian	This study; Macarovici, Zaharia, 1967
<i>Pachyacanthus</i> sp.		Vilkhovets	48°39' N 26°31' E	Volhynian	This study
Cetotheriidae indet.		Stăuceni	47°43' N 26°44' E	Early Volhynian	This study
		Kolubaivtsi	48°44' N, 26°39' E	Early Volhynian	This study
	<i>Cetotherium priscum</i>	Săveni-Ghireni	48°9' N 26°53' E	Early Volhynian	This study; Macarovici (1947)
	<i>Cetotherium priscum</i>	Mitoc-Prut	48°6' N 27°1' E	Early Volhynian	This study; Macarovici and Zaharia (1967)
? Cetotheriidae indet.	<i>Cetotherium mayeri</i>	Khonkivtsi	48°33' N 27°32' E	Early Volhynian	Hofstein, 1965; Gol'din, Startsev, 2017
Mysticeti indet.	–	Drăgușeni	48°1' N 26°49' E	Early Volhynian	This study
	“ <i>Archaeocetus fockii</i> ”	Hănești	47°54' N 26°58' E	Early Volhynian	This study; Macarovici, Zaharia, 1967
	“ <i>Archaeocetus fockii</i> ”	Ghireni	48°9' N 26°53' E	Early Volhynian	This study; Macarovici, Zaharia 1967
	“ <i>Archaeocetus fockii</i> ”	Khotin	48°30' N 26°29' E	Volhynian	This study; Macarovici, Zaharia, 1967

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- 38 Table S3. List of specimens used in this study
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- 40 MWGUW/ZI/99/064 – tail of Scombroidei from Kolubaivtsi
- 41 MWGUW/ZI/99/065 – seal skeleton from Kolubaivtsi
- 42 MWGUW/ZI/99/066 – rib of whale from Kolubaivtsi
- 43 AICUPM 1436 – fish body imprint of *Bothus parvulus* from Românești
- 44 AICUPM 1437 – incomplete fish body imprint of Scombroidei indet. from Aroneanu
- 45 AICUPM 1438 – caudal part of the body imprint of Scombroidei indet. from Erbiceni
- 46 AICUPM 1439 – anterior part of the body imprint of Clupeinae indet. from Voinești
- 47 AICUPM 7588 – complete fish skeleton imprints from Leucușești
- 48 AICUPM 7589 – dentary fragment of fish from Basarabi
- 49 AICUPM 7590 – scapula of Phocinae indet. 2 from Stăuceni
- 50 AICUPM 7591 – caudal vertebra of Phocinae indet. 2 from Stăuceni
- 51 AICUPM 7592 – periotic bone of *Kentriodon fuchsii* from Stăuceni
- 52 AICUPM 7593 – lumbar vertebra of *Kentriodon fuchsii* from Basarabi
- 53 AICUPM 7594 – caudal vertebra of Kentriodontidae indet. 2 from Stăuceni
- 54 AICUPM 7595 – thoracic vertebra of Kentriodontidae indet. 2 Stâncești
- 55 AICUPM 7596 – caudal vertebra of Kentriodontidae indet. 3 from Stăuceni
- 56 AICUPM 7597 – caudal vertebra of Cetotheriidae indet. from Stăuceni
- 57 AICUPM 7597 – caudal vertebra of Mysticeti indet. (“*Archaeocetus fockii*”) from Drăgușeni
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