SUPPLEMENTARY DATA

Brandtocetus, a new genus of baleen whales (Cetacea, Cetotheriidae) from the
late Miocene of Crimea

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APPENDIX S1. Description of characters used in phylogenetic analysis.

Characters 1–150 are adopted from Marx (2011).

(151) Shape of the anterior end of bulla in medial view: narrowed (0); oval (1); squared (2) (modified from Steeman, 2007; Ekdale et al., 2011).

(152) Relation of ascending processes of maxillae to premaxillae and nasals: maxillae constrict or cover medially located bones: no (0); yes (1) (Whitmore and Barnes, 2008).

(153) External occipital crest: present (0), absent (1) (Fordyce and Marx, 2013).

(154) Shape and size of the distal surface of the posterior process of the tympanoperiotic exposed at the posterolateral wall of the skull: small (height < 25% of height of the paroccipital process), irregular (0), large (height > 50% of height of the paroccipital process), quadrangular (1), large, triangular (2), large, oval or round (3), medium-sized, rhomboid or pentagonal, anteriorly directed (4).

(155) Zygomatic process of squamosal: long and low (0); long and high (1); short or reduced (2).

APPENDIX S2. Character-taxon matrix used for phylogenetic analysis.

Codings for characters 1–150 are adopted from Marx (2011) for all taxa except *Eucetotherium helmersenii*, *Cetotherium rathkii*, *Cetotherium riabinini*, *Joumocetus shimizui*, *Kurdalagonus mchedlidzei* and *Brandtocetus chongulek* and from Gol'din et al. (in press) for *Cetotherium rathkii*, *Cetotherium riabinini* and *Joumocetus shimizui*. Codings for characters 151–155 are introduced here.

Taxon	10	20	30	40	50	60	70	80
<i>Brandtocetus chongulek</i>	???????0?	??020????	???????100	1?????1???	00?0?11110	0011100120	001?0120?0	0210000002
<i>Eucetotherium helmersenii</i>	?????21100	1102011???	??????0100	1?0103?110	10?0?11010	0?11100020	???10?10?0	021???????
<i>Kurdalagonus mchedlidzei</i>	???????0?	???20????	??????0000	1011001???	???0?011??	?01?000020	00120?1020	011??000??
Taxon	90	100	110	120	130	140	150	155
<i>Brandtocetus chongulek</i>	1110100001	1211111111	11?1??????	???????????	???????????	???????????	???????????	0?031
<i>Eucetotherium helmersenii</i>	??1010????	1211??????	????1?0???	?1?01?2???	???????????	???????????	???????????	?0?11
<i>Kurdalagonus mchedlidzei</i>	??101000??	1?1???????	???????????	???????????	???????????	???????????	???????????	??041
Taxon	150	155						
<i>Zygorhiza kochii</i>	00000							
<i>Eomysticetus whitmorei</i>	00000							
<i>Aglaocetus patulus</i>	20100							
<i>Balaena mysticetus</i>	10102							
<i>Balaenoptera acutorostrata</i>	00100							
<i>Caperea marginata</i>	20131							
' <i>Cetotherium</i> ' <i>megalophysum</i>	??01?							
<i>Diorocetus hiatus</i>	10000							
<i>Eschrichtius robustus</i>	10100							
<i>Herpetocetus transatlanticus</i>	01010							
<i>Isanacetus laticephalus</i>	10100							
<i>Metopocetus durinasus</i>	?101?							
' <i>Cetotherium</i> ' <i>vandelli</i>	?01?0							
<i>Mixocetus elysius</i>	?01?0							
<i>Nannocetus eremus</i>	01?10							
<i>Parietobalaena palmeri</i>	20000							
<i>Piscobalaena nana</i>	01010							
<i>Titanocetus sammarinensis</i>	?0100							

APPENDIX S2 (continued).

Taxon	150	155
Patriocetus ehrlichii		?0000
Physeter catodon		00100
Aetiocetus cotylalveus		00000
Aetiocetus polydentatus		00000
Aetiocetus weltoni		00000
Aglaocetus moreni		20100
Archaeobalaenoptera castriarquati		?0000
Balaena ricei		?0002
Balaenella brachyrhynchus		10102
Balaenoptera bonaerensis		00100
Balaenoptera borealis		10100
Balaenoptera edeni		10100
Balaenoptera musculus		10100
Balaenoptera omurai		10100
Balaenoptera physalus		10100
Balaenoptera siberi		10100
Balaenula astensis		?0102
Chonecetus goedertorum		00000
Cophocetus oregonensis		?0000
Diorocetus chichibuensis		10000
Eschrichtioides gastaldii		?0100
Eubalaena glacialis		10102
Eubalaena shinshuensis		?0102
Janjucetus hunderi		00000
Mammalodon colliveri		0000?
Mauicetus lophocephalus		00000
Megaptera hubachi		?0100
Megaptera miocaena		10100
Megaptera novaeangliae		10100
Parabalaenoptera baulinensis		?0100
Parietobalaena yamaokai		20100
Pelocetus calvertensis		10100
Pinocetus polonicus		20100
Protororqualus cuvierii		?0100
Uranocetus gramensis		00000

APPENDIX S2 (continued).

Taxon	150	155
<i>Cetotherium rathkii</i>	10021	
<i>Cetotherium riabinini</i>	10021	
<i>Joumocetus shimizui</i>	00010	

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