

Table S1. Specimens of the six species analyzed, the number of vertebrae and the association of the synsacrum to the pelvic girdle. Abbreviation: f!: indicates the number of vertebrae fused to form the pygostyle

SPECIES	SPECIMEN	ONTOGENETIC STAGE	CERVICAL VERTEBRAE	CERVICO-THORACIC VERTEBRAE	THORACIC VERTEBRAE	SYNSACRAL VERTEBRAE	FREE CAUDAL VERTEBRAE	PYGOSTYLE	SYNSACRUM FUSED TO THE PELVIC GIRDLE
<i>Aptenodytes forsteri</i>	MACN-Or 8462	Adult	13	2	6	13	6	1 (5 f!)	No
<i>Aptenodytes forsteri</i>	MLP-ORN 1586	Adult		2	7	13	7	-	No
<i>Aptenodytes forsteri</i>	MLP-ORN 15192	Adult	13	2	6	13	-	-	No
<i>Eudyptes chrysocome</i>	MLP-ORN 1596	Immature/Adult	7 (incomplete, C1 to C6 are absent)	2	6	13	7	1 (5 f!)	No
<i>Pygoscelis adeliae</i>	MLP-ORN 1134	Adult	12 (incomplete, C4 is absent)	2	6	14	5 (incomplete)	1 (5 f!)	Yes
<i>Pygoscelis adeliae</i>	MLP-ORN 15475	Adult	12 (incomplete, C1 is absent)	2	6	14	6	1 (5 f!)	Yes
<i>Pygoscelis adeliae</i>	MLP-ORN 15476	Adult	9 (incomplete, C1 to C4 are absent)	2	6	14	5	1 (5 f!)	Yes
<i>Pygoscelis adeliae</i>	MLP-ORN 15177	Adult	9 (incomplete, C1 to C3 and C12 are absent)	2	6	14	4 (incomplete)	1 (5 f!)	Yes
<i>Pygoscelis adeliae</i>	MLP-ORN 15385	Juvenile/Immature	9 (incomplete, C1 to C3 and C12 are absent)	2	6	14	3 (incomplete)	-	Yes
<i>Pygoscelis adeliae</i>	MLP-ORN 15038	Adult	13	2	6	14	7	1 (5 f!)	Yes
<i>Pygoscelis adeliae</i>	MLP-ORN 15392	Juvenile/Immature	13	2	6	14	6	Only 3 preserved and still not f!	Still not f!
<i>Pygoscelis adeliae</i>	MLP-ORN 14680	Adult	13	2	6	14	7	1 (5 f!)	Yes
<i>Pygoscelis adeliae</i>	MLP-ORN 14242	Juvenile/Immature	13	2	6	14	5	1 (5 f!)	Yes

<i>Pygoscelis adeliae</i>	MLP-ORN 15389	Adult	7 (incomplete, C1 to C6 are absent)	2	6	14	4 (incomplete)	1 (5 fl!)	Yes
<i>Pygoscelis adeliae</i>	MLP-ORN 15138	Juvenile/Immature	10 (incomplete, C1 to C3 are absent)	2	6	14	5	1 (5, only 4 fl!)	Still not fl!
<i>Pygoscelis adeliae</i>	MLP-ORN 15137	Adult	13	2	7	14	6	1 (5 fl!)	Yes
<i>Pygoscelis adeliae</i>	MLP-ORN 14685	Adult	13	2	6	14	6	1 (5 fl!)	Yes
<i>Pygoscelis adeliae</i>	MACN-Or 68558	Adult	13	2	6	14	6	1 (5 fl!)	Yes
<i>Pygoscelis adeliae</i>	MACN-Or 68826	Juvenile/Immature	13	2	6	14	6	1 (5, only 4 fl!)	Yes
<i>Pygoscelis adeliae</i>	MACN-Or 69028	Juvenile/Immature	13	2	6	14	6	1 (5, only 4 fl!)	Still not fl!
<i>Pygoscelis adeliae</i>	MACN-Or 68542	Adult	13	2	6	14	6	1 (5 fl!)	Yes
<i>Pygoscelis adeliae</i>	MACN-Or 68544	Juvenile/Immature	13	2	6	14	6	1 (5, only 4 fl!)	Yes
<i>Pygoscelis adeliae</i>	MACN-Or 68557	Adult	13	2	7	13	6	1 (5, only 4 fl!)	Yes
<i>Pygoscelis adeliae</i>	MACN-Or 73283	Immature/Adult	13	2	5	14	6	1 (5 fl!)	Yes
<i>Pygoscelis antarcticus</i>	MLP-ORN 1138	Adult	5 (incomplete, C1 to C8 are absent)	2	6	14	6	1 (5 fl!)	Yes
<i>Pygoscelis papua</i>	MLP-ORN 783	Immature/Adult	13	2	6	14	6	1 (5 fl!)	Yes
<i>Pygoscelis papua</i>	MLP-ORN 14921	Juvenile/Immature	13	2	6	14	7	1 (5 fl!)	Still not fl!
<i>Pygoscelis papua</i>	MLP-ORN 14669	Adult	13	2	6	14	5	1 (5 fl!)	Yes
<i>Pygoscelis papua</i>	MLP-ORN 14896	Adult	13	2	5 (incomplete, T5 is absent)	14	2 (incomplete)	1 (5 fl!)	Yes
<i>Pygoscelis papua</i>	MLP-ORN 14610	Immature/Adult	12 (incomplete, C1 is absent)	2	6	14	5	1 (5, only 4 fl!)	Yes
<i>Pygoscelis papua</i>	MLP-ORN-14747	Adult	10 (incomplete, C1 to C3 are absent)	2	6	14	6	1 (5, only 4 fl!)	Yes

<i>Pygoscelis papua</i>	MLP-ORN 15410	Adult	13	2	6	13	6	1 (5 fl)	Yes
<i>Pygoscelis papua</i>	MLP-ORN 14900	Adult	7 (incomplete, C1 to C6 are absent)	2	6	14	6	-	Yes
<i>Pygoscelis papua</i>	MACN-Or 68596	Adult	13	2	6	14	6	1 (5 fl)	Yes
<i>Spheniscus magellanicus</i>	MLP-ORN 1598	Adult	13	2	6	13	6	1 (5 fl)	No
<i>Spheniscus magellanicus</i>	MLP-ORN 1407	Immature/Adult	12 (incomplete, C10 is absent)	2	6	13	6	1 (5 fl)	No
<i>Spheniscus magellanicus</i>	MLP-ORN 1464	Juvenile/Immature	13	2	6	2 (incomplete)	6	1 (5, only 4 fl)	No
<i>Spheniscus magellanicus</i>	MLP-ORN 1431	Adult	-	1 (incomplete, CT1 is absent)	6	13	5 (incomplete)	-	No
<i>Spheniscus magellanicus</i>	MLP-ORN 1322	Juvenile/Immature	11 (incomplete, C5 and C13 are absent)	1 (incomplete, CT1 is absent)	2 (incomplete)	13	6	1 (5, only 4 fl)	No
<i>Spheniscus magellanicus</i>	MLP-ORN 920	Adult	13	2	6	13	8	1 (5, only 4 fl)	No
<i>Spheniscus magellanicus</i>	MLP-ORN 896	Immature/Adult	8 (incomplete, C1 to C5 are absent)	2	6	13	6	1 (5, only 4 fl)	No
<i>Spheniscus magellanicus</i>	MLP-ORN 949	Adult	13	2	6	13	7	1 (5, only 4 fl)	No
<i>Spheniscus magellanicus</i>	MLP-ORN 903	Juvenile/Immature	13	2	6	13	4 (incomplete)	-	No
<i>Spheniscus magellanicus</i>	MLP-ORN 894	Juvenile/Immature	13	2	6	13	6	1 (5, only 4 fl)	No
<i>Spheniscus magellanicus</i>	MLP-ORN 1507	Juvenile/Immature	9 (incomplete, C5 to C8 are absent)	2	6	-	-	-	-
<i>Spheniscus magellanicus</i>	MLP-ORN 923	Adult	13	2	6	13	4 (incomplete)	-	No
<i>Spheniscus magellanicus</i>	MLP-ORN 901	Adult	9 (incomplete, C1 to C4 are absent)	2	6	13	-	-	No
<i>Spheniscus magellanicus</i>	MLP-ORN 922	Immature/Adult	12 (incomplete, C1 is absent)	2	6	13	6	1 (5, only 4 fl)	No

<i>Spheniscus magellanicus</i>	MLP-ORN 950	Adult	13	2	6	13	7	1 (5, only 4 fl)	No
<i>Spheniscus magellanicus</i>	MLP-ORN 1136	Adult	13	2	6	13	3 (incomplete)	-	No
<i>Spheniscus magellanicus</i>	MLP-ORN 1408	Juvenile/Immature	7 (incomplete)	2	5	13	6	1 (5, only 4 fl)	No
<i>Spheniscus magellanicus</i>	MLP-ORN 14435	Immature/Adult	13	2	6	13	6	1 (5 fl)	No
<i>Spheniscus magellanicus</i>	MACN-Or 54682	Juvenile/Immature	13	2	6	14	6	1 (5, only 4 fl)	No
<i>Spheniscus magellanicus</i>	MACN-Or 68393	Juvenile/Immature	8 (incomplete, C1 to C5 are absent)	2	6	14	5 (incomplete)	-	No
<i>Spheniscus magellanicus</i>	MACN-Or 69029	Juvenile/Immature	13	2	6	14	6	1 (5 fl)	No
<i>Spheniscus magellanicus</i>	MACN-Or 73287	Adult	13	2	6	14	6	-	No
<i>Spheniscus magellanicus</i>	MACN-Or 73289	Adult	13	2	6	14	6	1 (5 fl)	No
<i>Spheniscus magellanicus</i>	MACN-Or 73285	Juvenile/Immature	13	2	6	14	6	1 (5 fl)	No
<i>Spheniscus magellanicus</i>	MACN-Or 71169	Juvenile/Immature	13	2	6	14	4 (incomplete)	4 (still not fused, incomplete)	No
<i>Spheniscus magellanicus</i>	MACN-Or 54681	Adult	12 (incomplete, C1 is absent)	2	6	14	6	1 (5 fl)	No
<i>Spheniscus magellanicus</i>	MACN-Or 73284	Immature/Adult	13	2	6	14	6	1 (5 fl)	No
<i>Spheniscus magellanicus</i>	MACN-Or 78159	Adult	13	2	6	13	6	1 (5 fl)	No
<i>Spheniscus magellanicus</i>	MACN-Or 71168	Juvenile/Immature	12 (incomplete, C6 is absent)	2	6	14	-	-	No
<i>Spheniscus magellanicus</i>	MACN-Or 71167	Juvenile/Immature	13	2	7	13	5	1 (5 fl)	No
<i>Spheniscus magellanicus</i>	MACN-Or 73288	Juvenile/Immature	13	2	6	14	6	Only the first vertebra, incomplete.	No
<i>Spheniscus magellanicus</i>	MACN-Or 73286	Juvenile/Immature	13	2	6	13	6	1 (5, only 4 fl)	No