

Erwin J.O. Kompanje

Naturalis (Nationaal Natuurhistorisch Museum), Leiden & Natuurhistorisch Museum Rotterdam

# A case of symmetrical conjoined twins in a bottlenose dolphin *Tursiops truncatus* (Mammalia, Cetacea)

Kompanje, E.J.O., 2005 - A case of symmetrical conjoined twins in a bottlenose dolphin *Tursiops truncatus* (Mammalia, Cetacea) - DEINSEA 11: 147-150 [ISSN 0923-9308]. Published 29 December 2005

Case reports of conjoined twins ('Siamese twins') in wild mammals are very scarce. Most published reports of conjoined twinning concern cases in man or in domestic mammals. In this article a case of conjoined twinning in a wild mammal is described: a parapagus dicephalus with unilateral schistoprosopus in a bottlenose dolphin *Tursiops truncatus* stranded on the coast of the Netherlands in 1917. This case concerns the oldest known case of a symmetrical conjoined twin in a cetacean species.

Correspondence: dr Erwin J.O. Kompanje, Natuurhistorisch Museum Rotterdam, P.O. Box 23452, 3001 KL Rotterdam, The Netherlands, e-mail: e.j.o.kompanje@erasmusmc.nl

Keywords: conjoined twins, parapagus dicephalus, double monster, *Tursiops truncatus*.

## INTRODUCTION

Conjoined twins ('Siamese twins') are well known in man, in domestic and laboratory mammals, domestic and wild birds and in wild and captive-bred reptiles, amphibians and fishes, but are very rarely described in wild mammals. The precise incidence is unknown, most likely due to high prenatal and antenatal mortality. Almost all known cases of conjoined twins in wild mammals concern unborn embryos and fetus found during dissection of the pregnant dead female. The aim of this article is to describe a postnatal case of symmetrical conjoined twins in a wild mammal.

## Case report

A dead, 125 cm long, newborn female dicephalic bottlenose dolphin *Tursiops truncatus* (MONTAGU, 1824), with open umbilicus, was found on the beach at Wijk aan Zee, the Netherlands, on 20 July 1917. The specimen

was sold to the Rijksmuseum voor Natuurlijke Historie (now: Naturalis, National Museum of Natural History) in Leiden. After preservation, three photographs were made of the monstrum (Fig. 1). Shortly afterwards, the specimen was given on loan to the Anatomical Cabinet of Leiden University for further study, but nothing was published on this case. The specimen is untraceable now. It is neither in the Anatomical Cabinet nor in any other museum, and it is - unfortunately - most probably lost for science. It supposedly got lost after an English air raid during the Second World War (Kompanje 2001). The three photographs (reproduced here in Figure 1), still present in the archives of the National Museum of Natural History, form the only proof of this rare case. This case was mentioned in a review of *Tursiops* strandings along the Dutch coast (Kompanje 2001).

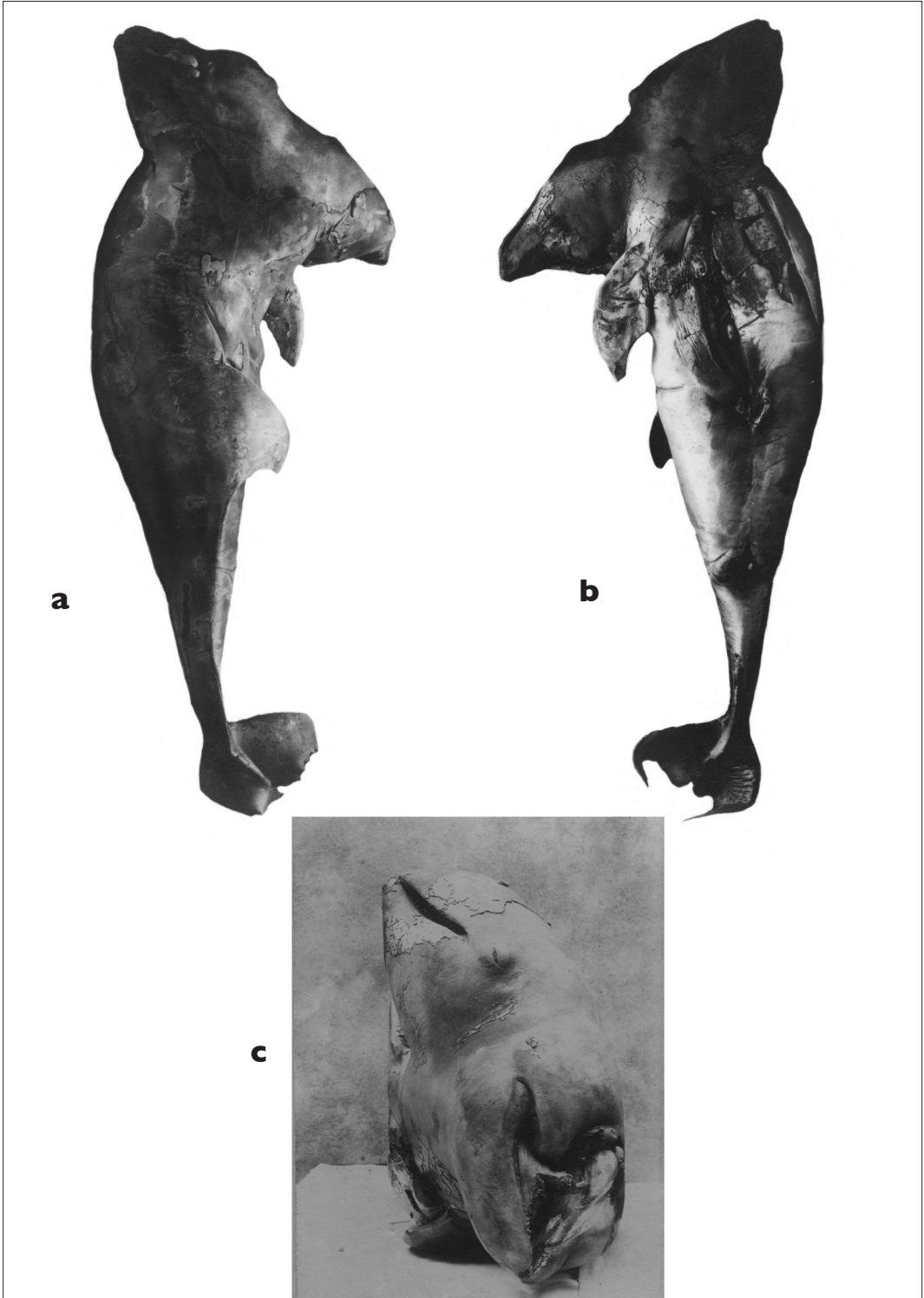


Figure 1 Parapagus dicephalus in a bottlenose dolphin *Tursiops truncatus* from Wijk aan Zee, the Netherlands, 20 July 1917. **a** dorsal view, **b** ventral view, **c** heads in frontal view. [Archives Naturalis, National Museum of Natural History, Leiden]

Table 1 Published cases of symmetrical conjoined twins in Cetacea.

Reference	species	taxonomy	age
Kawamura 1969	<i>Balaenoptera borealis</i>	thoracopagus	fetus
Kawamura & Kashita 1971	<i>Stenella coeruleoalba</i>	cephalopagus	fetus
Kamiya <i>et al.</i> 1981	<i>Stenella coeruleoalba</i>	parapagus dicephalus	fetus
Zinchenko & Ivashin 1987	<i>Balaenoptera acutorostrata</i>	thoracopagus	fetus
Kompanje 2001	<i>Tursiops truncatus</i>	parapagus dicephalus	newborn
Cesarini <i>et al.</i> 2004	<i>Tursiops truncatus</i>	parapagus diprosopus	newborn

**DISCUSSION**

Conjoined twins are always conjoined in one of only eight sites (Spencer 2001, 2003) and are named after the site of union [see also Kompanje (2005) - this volume - for further details]. Normal twinning is very rare in cetaceans. González *et al.* (1999) estimated a 0.5% occurrence of multiple gestation of all observed pregnant females in small cetaceans. With the exception of the present case, and of the case described by Cesarini *et al.* (2004), only four cases of conjoined twins in Cetaceans could be traced in the literature, all found in unborn foetuses during dissections in the Japanese and Russian whaling industry (Table 1). Other complex foetal anomalies found during these dissections includes holoprosencephaly, schistoprosopus and anotocephaly, all in baleen whales (e.g., Zinchenko & Ivashin 1960).

The present case is the first example of conjoined twins in a wild newborn dolphin. A diagnosis of a parapagus dicephalus mono-

somos dibrachius with unilateral schistoprosopus on the left head in a full-term female newborn bottlenose dolphin seems accurate. A second case in a wild newborn bottlenose dolphin is described by Cesarini *et al.* (2004). Judging from the description these authors gave (two faces, one braincase, one foramen magnum) this pair of conjoined twins should be diagnosed as parapagus diprosopus.

Symmetrical conjoined twins in wild terrestrial mammals have been very rarely reported (Table 2). Spontaneous occurrence of conjoined twins in laboratory animals is uncommon. Szabo (1989) reported one conjoined twin out of 10.000 in the rat and one case in 4000 rabbits bred in 20 years.

Spencer (2000a, 2000b, 2003) provides convincing evidence that symmetrical conjoined twins are the result of secondary fusion of two originally separate monovular embryonic discs, and are not the result of incomplete fission producing a partially separated zygote.

Table 2 Published cases of symmetrical conjoined twins in wild mammals, other than Cetacea.

Reference	species	taxonomy	age
Reisel 1671	<i>Lepus europaeus</i>	cephalopagus	newborn
Jung 1671	<i>Lepus europaeus</i>	cephalopagus	newborn
Seger 1671	<i>Lepus europaeus</i>	cephalopagus	newborn
Mentzel 1686	<i>Alces alces</i>	cephalopagus	fetus
Neugebauer 1851	<i>Lepus europaeus</i>	cephalopagus	newborn
Benesch 1957	<i>Lepus europaeus</i>	cephalopagus	newborn
Fay 1960	<i>Odocoileus virginianus</i>	parapagus dicephalus	fetus

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Received 12 October 2005

Accepted 9 November 2005