

# **Growth-related changes in speckles of wild Indo-Pacific bottlenose dolphin (*Tursiops aduncus*)**

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Mammals that change their body color throughout their lives are rare. In cetaceans, there are some species that exhibit this character. In the Indo-pacific bottlenose dolphin (*Tursiops aduncus*), speckles appear with growth. There exists only one study that has examined the relationship between age and speckle appearance in this species in Australia. We examined the speckle state with aging for this species ranging around Mikura island in Japan. Here we described the relationship between real age and speckle appearing. This study aims to contribute to clarify the function of coloration and to estimate the age based on speckles. We analyzed underwater video data recorded between the years 2003 and 2019 and focused on 107 identified dolphins. The speckles first appeared on the ventral part of the genital area at an average age of 6.5 years. Speckles increased in two specific directions: from the genital area to the jaw and from the ventral to the lateral side. The speckles were dotted when they first appeared but the dots merged with age. The relationship between age and speckle appearance was found to be similar in most individuals. Speckles were most likely to appear throughout their life; accordingly, they may function as visual signals of age. We discovered no speckles around the genital slit and this area was larger in females than in males. Because the age of the first speckle appearance was close to the age of the first birth in females, it may also help in the identification of sexual maturation. We also succeeded in creating an age estimation method using a general linear model based on speckle density in four body parts.