

論文名

The Social Structure of Indo-Pacific Bottlenose Dolphins (*Tursiops aduncus*) around Amakusa-Shimoshima, Japan

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Ecological factors played an important role in the evolution of social structure. In primates, ecological model (or socio-ecological model) was proposed and the better understanding of the variation in social structure has been provided. As well as primates, delphinoids show variety of social structure. However, the understandings of social structure among delphinoids have not been well understood as primates. My thesis aimed to reveal the social systems of dolphins and to discuss the determinants that shape their social systems by examining the social structure of Indo-Pacific bottlenose dolphins around Amakusa-Shimoshima.

Dolphins in this population form relatively large groups and this is an interesting characteristic of this population. The social structure of dolphins has been studied in populations with small groups and this population provides a special opportunity to study social structure of dolphins forming large groups.

In Chapter 1, I examined the association patterns among females. Although previous studies presumed that associations of females forming larger groups are not based on the reproductive states of females, it was revealed that females in larger groups also associate with them based on their reproductive states as reported in dolphins forming smaller groups. This result implies that even if dolphins have many choices for associates in larger groups, the reproductive state is an important factor to determine the association preference of females.

In Chapter 2, I examined the associations among males. It is reported that pairs or trios of males form strong, long-term associations, called alliances and alliances are considered as one of most complex social strategies to get access to receptive females. The presence/absence of the formation of alliances, however, varies within and between populations. On the basis of the previously proposed model, which demonstrated that the likelihood of alliances are

affected by the mean number of males competing for a female, I expected that male dolphins in the present study population form alliances. Association data strongly suggested alliance formation of males in the present population.

The significant events of community split and reunion has been reported in the present study population. Taking advantages of these opportunities, I tried to examine the social rigidity and plasticity of the dolphins in the present study population.

In Chapter 3, focusing on the significant event of the community split, I revealed that the effect of social relationships on the process of the community split differed between the sexes. Male dolphins split into two communities on the basis of the long-term social relationships existing before the split. On the other hand, neither long-term relationship, nor associations based on their reproductive states affected the memberships of the new communities.

In Chapter 4, I examined associations between dolphins from two communities of Amakusa population where dolphins from different communities started to share the same habitat since 2012. My results suggested that the social distinction between the two communities remained still in 2015 but some immigrant females assimilated into the different community.

These findings suggest that female-female relationships were based on the reproductive state and were characterized as socially tolerant although the social relationships not based on the reproductive state were also suggested to exist. The associations based on reproductive state are considered to enable them to protect their calves cooperatively and the socially tolerant relationships among females might be due to the characteristics of their prey. On the other hand, males were suggested to form alliances and these long-term relationships are considered to be important, as these relationships remained when the community restructuring occurred. These imply that access to mate for males are considered to be important driving forces of social systems. In general, ecological model of primates can be applicable to the social structure of Indo-Pacific bottlenose dolphins.