

Dolphins form largest alliance network outside humans, study finds

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Four male allies and a female. Credit: Simon Allen

Male bottlenose dolphins form the largest known multi-level alliance network outside humans, an international team led by researchers at the University of Bristol have shown. These cooperative relationships between groups increase male access to a contested resource.

The scientists, with colleagues from the University of Zurich and

University of Massachusetts, analyzed association and consortship data to model the structure of alliances between 121 [adult male](#) Indo-Pacific bottlenose dolphins at Shark Bay in Western Australia. Their findings have been published today in the *Proceedings of the National Academy of Sciences*.

Male dolphins in Shark Bay form first-order alliances of 2–3 males to cooperatively pursue consortships with individual females. Second-order alliances of 4–14 unrelated males compete with other alliances over access to female dolphins and third-order alliances occur between cooperating second-order alliances.

Co-lead author Dr. Stephanie King, associate professor from Bristol's School of Biological Sciences, said, "Cooperation between allies is widespread in [human societies](#) and one of the hallmarks of our success. Our capacity to build strategic, cooperative relationships at multiple social levels, such as trade or military alliances both nationally and internationally, was once thought unique to our species."



Six allied males and female consort. Credit: Simon Allen

"Not only have we shown that male bottlenose dolphins form the largest known multilevel [alliance](#) network outside humans, but that cooperative relationships *between* groups, rather than simply alliance size, allows males to spend more time with females, thereby increasing their reproductive success."

Dr. Simon Allen, senior lecturer at Bristol's School of Biological Sciences, who contributed to the study, said, "We show that the duration over which these teams of male dolphins consort females is dependent upon being well-connected with third-order allies, that is, [social ties](#) between alliances leads to long-term benefits for these males."

Intergroup cooperation in humans was thought to be unique and dependent upon two other features that distinguish humans from our common ancestor with chimpanzees, the evolution of pair bonds and parental care by males. "However, our results show that intergroup alliances can emerge without these features, from a social and mating system that is more chimpanzee like," said Richard Connor, professor emeritus at the University of Massachusetts and now affiliated with Florida International University, who co-led the study with Dr. King.

The publication of the importance of third level or intergroup alliances in dolphins in 2022 holds special significance as the team celebrate the 40th anniversary of the start of Shark Bay dolphin research in 1982 and the 30th anniversary of the publication in 1992 of their discovery of two levels of male alliance formation, also published in the *Proceedings of the National Academy of Sciences*.



Male trio with female. Credit: Simon Allen

Professor Dr. Michael Krützen, an author on the study and head of the Anthropology Institute at the University of Zurich, said, "It is rare for non-primate research to be conducted from an anthropology department, but our study shows that important insights about the evolution of characteristics previously thought to be uniquely human can be gained by examining other highly social, large-brained taxa."

Dr. King concluded: "Our work highlights that dolphin societies, as well

as those of nonhuman primates, are valuable model systems for understanding human social and cognitive evolution."

More information: Strategic intergroup alliances increase access to a contested resource in male bottlenose dolphins, *Proceedings of the National Academy of Sciences* (2022). doi.org/10.1073/pnas.2121723119

Provided by University of Bristol

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