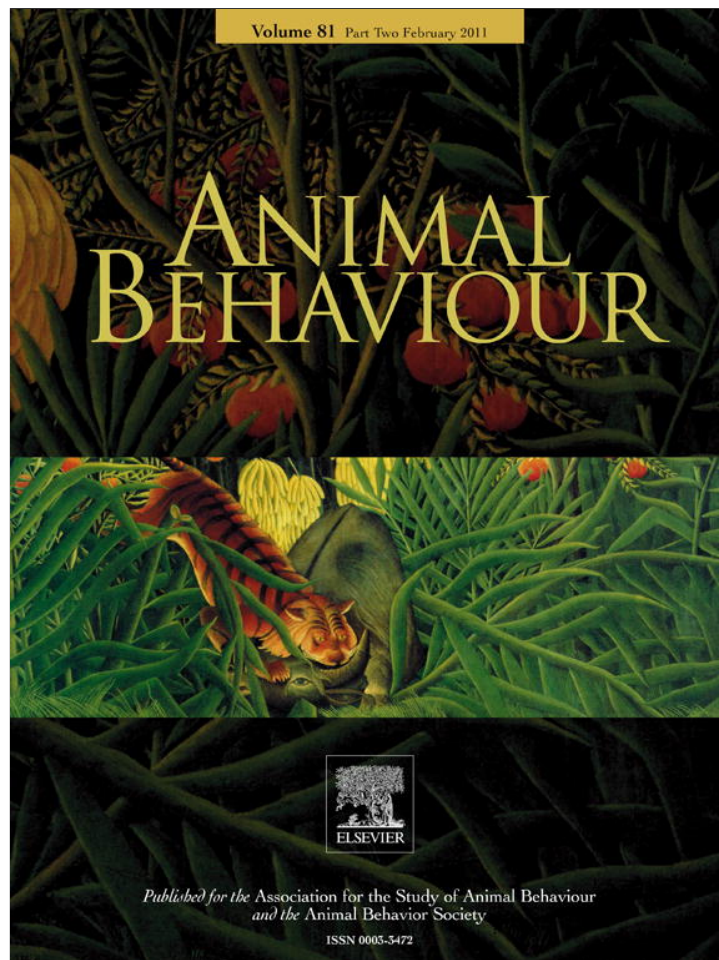


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## Book Review

***Animal Homosexuality: A Biosocial Approach*. By Aldo Poiani. Cambridge: Cambridge University Press (2010). Pp. 576. Price £40.00 hardback.**

From fruit flies to bonobos, it is no longer controversial that many animals routinely engage in homosexual behaviour; some individuals may even be homosexual (i.e. exclusively sexually attracted to the same sex). 'Gay animals' have been the subject of television documentaries, museum exhibitions, such as the controversial 'Against Nature' exhibit at the Natural History Museum of Oslo in 2006, and even stand-up comedy routines; popular British comedian Ricky Gervais based one of his early recorded shows on the graphic illustrations from Bagemihl's (1999) landmark bestiary of homosexual behaviour. Ask a biologist why homosexual behaviour occurs in ultimate or proximate terms, however, and you are more likely to elicit a blush than a coherent explanation. Many possible scenarios for the evolution of homosexual behaviour have been presented, but only relatively recently have we been putting serious empirical flesh on hypothetical bones.

Aldo Poiani's remarkable new book is the latest and, with over 500 reference-packed pages, arguably the most ambitious, attempt to synthesize the literature and sort the real contenders from the red herrings in the mix. The text opens with a history of the scientific study of homosexuality and identifies the hypotheses so far presented (summarized in a 14-page table not for the faint hearted). A second chapter then covers the definitions used throughout the book, complemented by a comprehensive glossary, and describes the methods available to study animal sexuality. These introductory sections are extremely well written. Poiani successfully demonstrates why homosexual behaviour matters and uses the topic as an engaging platform to cover major epistemological and theoretical issues such as multicausality and reductionism in science, Tinbergen's levels of analysis, and the nature of adaptation. These discussions highlight the subject's often overlooked potential as a stimulating teaching case study for the evolution of a complex behavioural trait. After drawing early attention to the limitations of the methods and data at our disposal, Poiani then sets the stage for a critical review of the empirical literature. Subsequent chapters take on particular aspects of the puzzle in turn.

Chapter 3 considers the genetics of homosexuality, detailing genetic models such as sexually antagonistic selection, kin selection and recurrent mutation. Pedigree studies, twin studies and the related evidence that particular chromosomal loci control the expression of same-sex sexual behaviour are covered in depth. Chapter 4 focuses on ontogenetic processes, specifically on early developmental influences, such as family environments and prenatal exposure to steroid hormones, along with the study of relevant biomarkers, such as 2D:4D. The interesting hypothesis that homosexuality may evolve in conjunction with selection for neoteny in some species is reviewed favourably. Expanding on these discussions, chapters 5 and 6 provide thorough reviews of endocrine-, nervous system- and immune function-related mechanistic hypotheses for homosexual behaviour.

The book then shifts focus to consider theory and evidence for socioecological correlates of homosexuality in the animal kingdom. These chapters include new comparative phylogenetic analyses on both avian and mammalian data sets introduced earlier in the book, suggesting some important differences between these taxa. Chapter 7 evaluates adaptive motivations for social segregation of the sexes, and the potential impacts of such segregation on the expression and function of homosexual behaviour. Chapter 8 considers 'social, life history and ecological theatres' more broadly, but with particular emphasis on new expansions of reproductive skew theory. It is here that Poiani's own ideas begin to take centre stage.

In the penultimate guest chapter, Alan Dixson provides a stand-alone review of homosexual behaviour in primates. After demonstrating such adept capability with the impressive range of topics so far discussed, it is puzzling that Poiani chose not to cover this material himself. Nevertheless, the review makes a useful and solid contribution. Dixson's more concise prose draws attention to Poiani's tendency to overelaborate on some concepts in previous sections, but this is a minor gripe. The book's wise use of periodic bullet summaries and logical structuring make for a well-presented and easily navigated text.

Poiani then takes stock and presents his own synthesis as the grand 'Biosocial Model of Homosexuality'. Previous reviews on homosexual behaviour have struggled in driving home strong conclusions from the literature (e.g. Bagemihl 1999; Sommer & Vasey 2006). Recognizing this trend, and following the integrationist philosophy of the book, Poiani's optimistic approach is to incorporate as many supported explanatory pathways as possible, cutting across all levels of analysis, into a broad schema. The result may be best considered a heuristic device to guide future study, with researchers urged to emphasize or rule out the particular linked pathways that best fit their own observations. For some, this might also be seen as an unsatisfying conclusion; the model is frustratingly complex and in itself cannot be regarded as a new theory. Yet, it precisely reflects the strongest conclusion that the current literature can make: animal homosexuality can only be understood as a diverse collection of multicausal phenomena. Importantly, it also encourages us to consider how possible explanations might interact and work in tandem. Ultimately, it is this firm commitment to an integrative and pluralistic perspective that marks out Poiani's contribution to the literature.

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