

## **The (mis)use of the term ‘commensalism’ in primatology**

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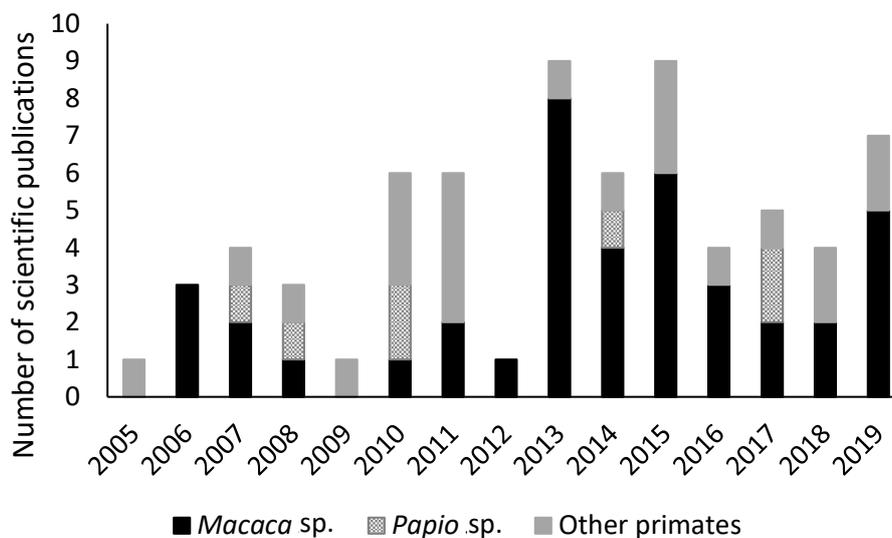
3 This commentary arose from a workshop entitled ‘What works, and what doesn’t work? The  
4 challenge of creating effective applied conservation research in human-modified habitats’,  
5 held during the joint meeting of the European Federation for Primatology and the Primate  
6 Society for Great Britain in Oxford, 2019. One discussion point highlighted the different use  
7 of terminology between disciplines as a challenge for effective multidisciplinary  
8 conservation research. Growing number of publications have drawn attention to the misuse  
9 of the terms such as human-wildlife conflict (Marshall et al. 2007, Peterson et al. 2010,  
10 Davidar 2018), crop-raiding (Hill 2017), or ecotourism (McKinney 2017). Here we widen this  
11 conversation by reflecting on an additional term regularly used in primatology:  
12 commensalism. Here, we will give the different definitions of the term ‘commensal’ used  
13 across disciplines and the implications of its misuse. We will then discuss whether this term  
14 can be used to categorise human-nonhuman primate (afterward primates) relationships,  
15 and conclude by proposing alternative terminology.

### **16 Contrasting definitions and its implications**

17 A commensal relationship is defined in the biological sciences as ‘an association between  
18 two organisms in which one benefits and the other derives neither benefit nor harm’  
19 (Oxford Dictionary 2015). Commensal species gain benefits such as nutrients, shelter,  
20 support, or locomotion from a partner species, which remains unaffected. However,  
21 primatologists commonly define commensal primates as ‘primate populations that take  
22 advantage of human food, waste or crops to supplement their diet or as their main food  
23 source’ (Gautier and Biquand 1994: p210). After its introduction in the 1990s, the term

24 'commensalism' resurged following Paterson and Wallis' (2005) efforts to avoid the negative  
25 implications of terms such as 'pest' or 'weed' species.

26 While commensalism is commonly used for describing human-primate relationships,  
27 particularly for *Macaca* and *Papio* species (68%, Figure 1), only 8 papers in our literature  
28 review (12%) defined their use of commensalism. Two of these papers acknowledge the  
29 biological definition of 'commensalism' as described above, but note that in primatology the  
30 term is used more broadly to mean primates living in close proximity to humans, or those  
31 using anthropogenic landscapes and resources. All other papers which defined  
32 'commensalism' used this definition, after Gautier and Biquand (1994), mirroring the way  
33 the term was used by authors who did not offer a definition.



34

35 Figure 1: Number of scientific papers published in peer-reviewed journals using the term  
36 'commensal' between 2005-2019. Papers were searched via Google Scholar using the terms  
37 'primate' and 'commensal'. We chose 2005 as the starting date based on the publication  
38 date of Paterson and Wallis' definition of 'commensal primates'. We included peer  
39 reviewed articles and book chapters, but omitted abstracts, theses, and encyclopaedia

40 entries. All relevant papers were read for the use of 'commensalism' in this context; those  
41 that used the term were then checked for (a) whether (and how) commensalism was  
42 defined by the authors, (b) what taxonomic groups were discussed, and (c) whether the  
43 paper reported specific positive or negative outcomes of the human-primate relationship.

44

45 Using 'commensalism' imprecisely may lead readers to think that human-primate  
46 relationships have a clear, one-way benefit, obscuring potentially important risks to either  
47 humans or animals. This may have unintended consequences on the relationships between  
48 local communities and primates, potentially increasing resentment towards primates and  
49 undermining conservation efforts. However, of 69 studies published in 2005-2019 using the  
50 term 'commensal', roughly half (37 or 54%) highlighted negative effects for either the  
51 humans or the primate species involved, increasing confusion around what the authors  
52 mean about the term 'commensal'. Finally, commensalism does not specifically refer to  
53 dietary benefits, but an array of benefits such as shelter or support against predators.  
54 Therefore, using the term 'commensal' only for dietary benefits conferred by humans  
55 diminishes our understanding of the relationships between humans and primates.

56

### 57 **Can non-human primates ever be considered commensal with humans?**

58 The categorisation of human and primate relationships is complex. Some primate  
59 populations have multilevel interactions with humans, which include a multitude of foraging  
60 resources, human users, and environments involved. The following factors should be taken

61 into consideration when determining whether a primate population can be called  
62 'commensal':

63 1) Foraging resources (if applicable)

64 Feeding on human-sourced food can be considered as costly, commensal or mutually  
65 beneficial. For instance, while some people tolerate crop-foraging by primates (Riley and  
66 Priston 2010), others would consider it as damage or competition. Similarly, provisioning  
67 can provide some benefits to humans, such as improved well-being, but can also be costly  
68 due to aggression or pathogen transmission. Therefore, we suggest that primates be  
69 considered commensal to humans only when they feed on discarded human food, and  
70 when we have demonstrated that it does not present any direct or indirect costs for human  
71 users.

72 2) Sustainable relationship

73 Commensalism must be recognised as a sustained relationship, and it cannot be defined by  
74 one species gaining short-term benefits from another. For example, provisioned wildlife  
75 may gain easy nutrients in the short-term, but run a higher risk of pathogen transmission,  
76 human-animal aggression, or dietary imbalance in the long-term, so that the benefits are  
77 short-lived. Therefore, evidence of a commensal relationship must be sustained over at  
78 least two generations to consider the potential long-term changes associated with this  
79 interspecies relationship.

80 3) Cost/benefit ratio evidence

81 For a primate population to be called 'commensal' in relation to humans, the cost/benefit  
82 ratio of the relationship, in the short and long-term, must be assessed. However, to date,

83 little is known about potential costs and benefits that humans, and living in anthropogenic  
84 landscapes, might provide for wild primates. Therefore, more research is needed to better  
85 understand the cost/benefit ratio of relationships between humans, primates and their  
86 shared environments, so that we can reassess whether the term 'commensal' could ever be  
87 used to describe human-primate relationships.

88

## 89 **Conclusion**

90 Words matter. It is our duty as scholars to use the most accurate terminology available to  
91 reduce confusion across disciplines, and it is imperative that we consider the unintended  
92 consequences of our word choices. Therefore, we suggest that primatologists refrain from  
93 using the term 'commensal' if not all criteria are met. Instead, we propose using more  
94 neutral terms, depending on context, which would advance our understanding of those  
95 human-primate dynamics.

96 • **Sympatric primates** – The term sympatric is defined as 'animal species or  
97 populations occurring within the same or overlapping geographical areas' (Oxford  
98 Dictionary 2015). Sympatric does not imply any specific relationship between the  
99 two species, and makes no statement on provisioning, crop-foraging, or other shared  
100 resources.

101

102 • **Provisioned primates** – This term describes a population of primates that use  
103 human-sourced foods freely given to them by the humans.

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- 105       • **Crop-foraging, human-sourced foraging, or urban-foraging primates** – These terms  
106       are neutral and refer to foraging on agricultural plants or on human food found in  
107       urban areas in the same way we would report other foraging strategies.

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## 109 **References**

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