

# Statistical power to detect multiple paternity in populations of highly fertile species: how many females and how many offspring should be sampled?

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© 2016, Springer-Verlag Berlin Heidelberg. Abstract: One of the central issues of behavioral ecology focuses on the probability of detecting multiple paternity in a scenario of polygamy. The main problem for this kind of analysis arises in species with large number of offspring in the same litter and large population sizes in which only a small fraction of progeny and females can be analyzed. Here, we present a method to estimate the statistical power to detect multiple paternity for these species. Since calculations involved handling of very large numbers, Ramanujan's approximation to factorials was used to make them possible in the R software. We exemplified this method using features observed in crabs; (i) females carry thousands or millions of embryos per brood, (ii) typically less than 50% of females show multiple paternity, and (iii) high contribution of a single male (>90%) in a brood. Genetic parental analysis assumes the use of loci that allow maximal discrimination among indiv