Correction

In our article "Haplodiploidy and the evolution of eusociality: split sex ratios" (Gardner et al., *American Naturalist* 179:240–256), we neglected the impact of split sex ratios on the class reproductive values of females and males in the context of our model of queen replacement. Correcting this oversight changes some of our quantitative results (see below). In particular, it reduces the potential for both facultative and obligate helping in this model and prevents haplodiploidy from ever promoting the evolution of obligate helping ($\alpha_{\mathrm{OBL}} \leq 1$). This strengthens our general conclusion that the haplodiploidy effect often only weakly promotes—and may even inhibit—the evolution of helping and hence has not been an important factor in driving the evolution of eusociality.

While the elements $\wp$ of the gene-flow matrix appearing on page 253 are correct in the absence of split sex ratios ($\bar{z}_{\mathrm{R}} = \bar{z}_{\mathrm{L}} = \bar{z}$), more generally they are given by $\wp_{\mathrm{f}\leftarrow\mathrm{f}} = 1/2[q(1 - \bar{z}_{\mathrm{R}})]/(1 - \bar{z}) + 1/4[(1 - q)(1 - z_{\mathrm{L}})/(1 - \bar{z})]$, $\wp_{\mathrm{f}\leftarrow\mathrm{m}} = 1 - (1/2[q(1 - \bar{z}_{\mathrm{R}})/(1 - \bar{z})] + 1/4[(1 - q)(1 - \bar{z}_{\mathrm{L}})/(1 - \bar{z})])$, $\wp_{\mathrm{m}\leftarrow\mathrm{f}} = [q\,\bar{z}_{\mathrm{R}}/\bar{z}] + 1/2[(1 - q)\bar{z}_{\mathrm{L}}/\bar{z}]$ and $\wp_{\mathrm{m}\leftarrow\mathrm{m}} = 1 - ([q\,\bar{z}_{\mathrm{R}}/\bar{z}] + 1/2[(1 - q)\,\bar{z}_{\mathrm{L}}/\bar{z}])$. This leads to class reproductive values of $c_{\mathrm{f}} = [2(1 - \bar{z})(qz_{\mathrm{R}} + \bar{z})]/[\bar{z}(5(1 - \bar{z}) - q) + q(2 - \bar{z})z_{\mathrm{R}}]$ and $c_{\mathrm{m}} = [\bar{z}(3(1 - \bar{z}) - q(1 - z_{\mathrm{R}}))]/[\bar{z}(5(1 - \bar{z}) - q) + q(2 - \bar{z})z_{\mathrm{R}}]$. This impacts upon sex allocation, and expression (9) must be replaced by

$$(\bar{z}_{\mathrm{R}}, \bar{z}_{L}) = \begin{cases} \left[0, \dfrac{3 - q}{4(1 - q)}\right] & \text{if } q < 1/3 \\ (0, 1) & \text{if } 1/3 \leq q \leq (1 + 2\phi)/(3 + 2\phi) \\ \left[\dfrac{2 - (1 - q)(3 + 2\phi)}{4q(1 + \phi)}, 1\right] & \text{if } q > (1 + 2\phi)/(3 + 2\phi) \end{cases}.$$

It also changes the potential for facultative helping in queenright colonies. Expression (10) must be replaced by

$$\alpha_{\mathrm{FAC}} = \begin{cases} \dfrac{1 + 2\phi}{2} & \text{if } q < (1 + 2\phi)/(3 + 2\phi) \\ \dfrac{q(1 + \phi)}{q(2 + \phi) - \phi} & \text{if } q \geq (1 + 2\phi)/(3 + 2\phi) \end{cases}.$$

Finally, it changes the potential for obligate helping in both queenright and queenless colonies. Expression (11) must be replaced by

$$\alpha_{\mathrm{OBL}} = \begin{cases} \dfrac{(1 + q)(1 + 2\phi)}{4} & \text{if } q < 1/3 \\ \dfrac{1 + 2\phi}{3} & \text{if } 1/3 \leq q \leq (1 + 2\phi)/(3 + 2\phi) \\ \dfrac{(1 + \phi)[1 + q + 2(1 - q)\phi]}{4 + 2(1 - q)\phi} & \text{if } q > (1 + 2\phi)/(3 + 2\phi) \end{cases}.$$

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Accordingly, figure 3 and its accompanying legend should be replaced as shown. We apologize for any confusion caused by this oversight.

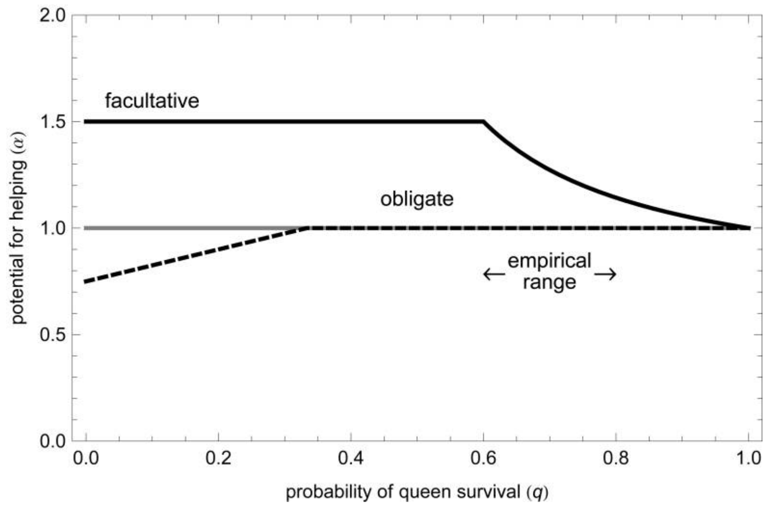

Figure 3: Potential for helping in a model of split sex ratios owing to queen replacement, assuming full monogamy ($\phi = 1$). In the context of the elaboration of helping, haplodiploidy either inhibits or has no impact upon obligate helping (dashed black line). Over the empirically estimated range of queen survival ($0.6 < q < 0.8$), haplodiploidy has no impact upon the potential for obligate helping, which remains at $\alpha_{\mathrm{OBL}} = 1.0$. Conversely, haplodiploidy always promotes facultative helping in relatively female-biased (i.e., queenright) colonies (solid black line). The maximum potential for facultative helping is at $\alpha_{\mathrm{FAC}} = 1.50$ at the lower end of the empirically valid rates of queen survival.

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