As an example of this type of results, it can be proved that if $\gamma > \beta$, the $GHD\,\mathrm{I}\,(\alpha, \beta, \gamma, \lambda)$ is the mixture

$$Poisson\,(\Lambda) \underset{\Lambda}{\wedge} Gamma\left(\alpha, \frac{\lambda\,(1-P)}{1-\lambda\,(1-P)}\right) \underset{P}{\wedge} GBeta\,(\gamma-\alpha-\beta, \beta, \alpha, \lambda)\,, \tag{2.4}$$

where $GBeta\,(\gamma-\alpha-\beta, \beta, \alpha, \lambda)$ denotes a generalization of the Beta distribution whose density function is

$$f_P\,(p) = \frac{1}{{}_2F_1\,(\alpha, \beta; \gamma; \lambda)} \frac{\Gamma(\gamma)}{\Gamma(\gamma-\beta)\Gamma(\beta)}\ \frac{p^{\gamma-\beta-1}\,(1-p)^{\beta-1}}{(1-\lambda\,(1-p))^{\alpha}}, \qquad 0 \leq p \leq 1. \tag{2.5}$$