1.8. Evidently, the distribution is

$$P\{X=k\} = \frac{\binom{r}{k}\binom{b}{n-k}}{\binom{r+b}{n}}, \qquad k=0,\ldots,n.$$

Now

$$\begin{aligned}
EX &= \sum_{k=0}^{n} k\frac{\binom{r}{k}\binom{b}{n-k}}{\binom{r+b}{n}} = \binom{r+b}{n}^{-1}\sum_{k=1}^{n} k\binom{r}{k}\binom{b}{n-k} = \binom{r+b}{n}^{-1}\sum_{k=1}^{n}\frac{r!}{(r-k)!(k-1)!}\binom{b}{n-k} \\
&= \frac{r}{\binom{r+b}{n}}\sum_{k=1}^{n}\binom{r-1}{k-1}\binom{b}{\{n-1\}-\{k-1\}} = \frac{r}{\binom{r+b}{n}}\binom{b+r-1}{n-1} = \frac{rn!(b+r-n)!}{(b+r)!}\frac{(b+r-1)!}{(b+r-n)!(n-1)!} \\
&= \frac{nr}{b+r}.
\end{aligned}$$

To compute variance we first compute $E(X^2)$, viz.,

$$E(X^2) = \sum_{k=0}^{n} k^2\frac{\binom{r}{k}\binom{b}{n-k}}{\binom{r+b}{n}} = \binom{r+b}{n}^{-1}\sum_{k=1}^{n} k^2\binom{r}{k}\binom{b}{n-k}.$$