Additional file 1: The repeatability for the wing pattern elements was estimated using 114 individuals, representing all species and both sexes. $m_1$ and $m_2$ represent the same individual being processed twice by our imaging and analysis platform. $m_2$ and $m_3$ represent the same image, being analysed twice. Imaging and analysis were conducted by four different researchers and yield high levels of repeatability ($R^2$). Numbers refer to figure 1 in the main text.

| Trait (wing pattern element) | | $m_1$ vs $m_2$ Regression Coefficient | R-squared | $m_2$ vs $m_3$ Regression Coefficient | R-squared |
|---|---|---|---|---|---|
| VFW WhiteArea M1 | (1w) | 0.884 | 0.894 | 0.968 | 0.876 |
| VFW BlackArea M1 | (1b) | 1.002 | 0.992 | 0.993 | 0.990 |
| VFW YellowArea M1 | (1y) | 0.990 | 0.990 | 0.990 | 0.993 |
| VFW BlackArea Cu1 | (2) | 0.999 | 0.992 | 0.996 | 0.994 |
| VFW Band | (3) | 0.964 | 0.963 | 0.980 | 0.966 |
| VHW Band | (5) | 0.997 | 0.990 | 0.995 | 0.989 |
| DFW WhiteArea M1 | (6w) | 1.019 | 0.983 | 0.996 | 0.990 |
| DFW BlackArea M1 | (6b) | 1.015 | 0.998 | 1.015 | 0.998 |
| DFW YellowArea M1 | (6y) | 1.012 | 0.998 | 0.997 | 0.998 |
| DFW WhiteArea Cu1 | (7w) | 0.973 | 0.953 | 0.988 | 0.948 |
| DFW BlackArea Cu1 | (7b) | 0.989 | 0.986 | 1.008 | 0.988 |
| DFW YellowArea Cu1 | (7y) | 0.989 | 0.991 | 1.003 | 0.995 |
| VFW HeronsFormula | (8) | 0.998 | 0.984 | 0.993 | 0.994 |
| VFW Xto2nd | | 0.986 | 0.976 | 0.990 | 0.983 |
| VFW 2to7th | | 1.021 | 0.975 | 0.997 | 0.996 |
| VFW Xto7th | | 0.981 | 0.973 | 0.998 | 0.985 |
| VHW HeronsFormula | (9) | 0.985 | 0.987 | 0.986 | 0.993 |
| VHW Xto2nd | | 0.986 | 0.976 | 0.990 | 0.983 |
| VHW 2to7th | | 1.006 | 0.985 | 1.004 | 0.993 |
| VHW Xto7th | | 0.977 | 0.975 | 0.977 | 0.979 |
| Overall (mean) | | 0.989 | 0.978 | 0.993 | 0.981 |