

## Supplementary information

“A genomic perspective of the Pink-headed Duck *Rhodonessa caryophyllacea* suggests a long history of low effective population size”

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**Supplementary Table S1.** Synapomorphies supporting monophyly of four different clades when mapped on to the molecular tree: a) *Marmaronetta*, *Rhodonessa*, *Netta* and *Aythya*, b) *Rhodonessa*, *Netta* and *Aythya*, c) *Netta* and *Aythya*, and d) *Aythya*. Character numbers refer to Livezey (1996). For each character the state observed in the respective clade is written in bold. Note that *N. erythrophthalma* is not considered in this as it was not included in the molecular analysis. Also: *Asarcornis scutulata* is not included in the morphological study.

**a) Monophyly of *Marmaronetta*, *Rhodonessa*, *Netta* and *Aythya*:**

s8 Carpometacarpus, extremitas proximalis carpometacarpi, trochlea carpalis, labrum ventralis, orientation relative to corpus carpometacarpi, facies ventralis: (a) coplanar; **(b) laterally rotated**  
n8 Dark preorbital stripe (problematic): (a) present (outgroups); **(b) obsolete or absent** (includes fuligula, marila, and affinis, in which face darkened)  
n9 Dark, contrasting auricular spot: (a) present; **(b) absent**.  
d44 Metallic-colored speculum: (a) present; **(b) absent**.

**b) Monophyly of *Rhodonessa*, *Netta* and *Aythya*:**

s1 Columna vertebralis, vertebrae cervicales, modal number: (a) 16; **(b) 17**.  
s3 Sternum, rostrum sterni, labrum interna (character 82): (a) a rounded notch; **(b) rounded notch with small medial point**.  
s5 Humerus, extremitas distalis, relative caudal prominence of epicondyla dorsalis and ventralis: (a) epicondyla essentially equal; **(b) epicondylus dorsalis cranial to epicondylus ventralis**.  
s6 Carpometacarpus, extremitas proximalis carpometacarpi, trochlea carpalis, labrum dorsalis, rounded prominence on distal terminus: (a) present; **(b) absent**.  
s7 Carpometacarpus, corpus carpometacarpi, os metacarpale majus, facies dorsalis, impressio m. extensor metacarpi ulnaris, position relative to synostosis metacarpalis proximalis: (a) completely proximal; **(b) opposite, at least in part**.  
s13 Tarsometatarsus, extremitas distalis tarsometatarsi, canalis interosseus tendineus, osseus lamina covering dorsal (of two) canaliculi: (a) present; **(b) largely or completely lacking**.  
t1 Syrinx, bulla syringealis (primary chamber): (a) solid; **(b) with fenestrae**.  
t4 Syrinx, bulla syringealis, solid, bulbous, basal chamber: (a) absent; **(b) present**.  
d13 Hallux, cutaneous lobation: (a) absent; **(b) present (small in caryophyllacea)**.  
d19(a>b) Foot, color (adults, both sexes): (a) greenish or yellowish; (b) orange or reddish; **(c) gray**.  
d24(a>b) Iris, color: (a) dark brown; (b) red (brighter in adults, males); (c) orange; (d) yellow.  
d27 Rump, and usually also undertail coverts, contrasting blackish color: absent; **(b) present (vestigial to obsolete in australis)**.  
d60 Proximal secondary remiges, fine black external margin: (a) absent; **(b) present**.

**c) Monophyly *Netta* and *Aythya***

s14 Tarsometatarsus, corpus tarsometatarsi, relative dorsal prominence of facies subcutanea medialis and facies subcutanea lateralis: (a) equal, no torsion of corpus evident; **(b) medialis less prominent than lateralis, related to significant torsion of corpus about long axis**.  
t2 2. Syrinx, bulla syringealis (primary chamber): (a) rounded; **(b) flattened "whorl"**.  
d61 Secondary remiges, dark (sub)terminal band: (a) absent; **(b) present**.

**d) Monophyly of *Aythya***

s4 Humerus, extremitas proximalis humeri, fossa pneumaticipitalis, foramen pneumaticum: (a) present; **(b) absent**.

s9 Femur, corpus femoris, craniocaudal curvature in lateral perspective: absent; **(b) present.**

s11 Tibiotarsus, extremitas distalis tibiotarsi, condyla medialis et lateralis, relative cranial prominence: (a) condylus medialis distinctly greater than condylus lateralis; **(b) condyla equally prominent.**

s12 Tibiotarsus, extremitas proximalis tibiotarsi, crista cnemialis cranialis, distinct ridge continuing distally along corpus tibiotarsi, facies cranialis, margo cranialis: (a) absent; **(b) present.**

d24(b>c,d), Iris, color: (a) dark brown; (b) red (brighter in adults, males); (c) orange; **(d) yellow.**

**Supplementary Fig. S1.** The maximum-likelihood tree from the analysis of a data set consisting of 2086 bp (cytochrome *b* and NADH dehydrogenase subunit 2 genes) obtained from 66 species of ducks, geese and swans. Numbers at the nodes are bootstrap values (after 100 replicates).

