



Molecular phylogeny of the spoonbills (Aves: Threskiornithidae) based on mitochondrial DNA

R. TERRY CHESSER^{1,6}, CAROL K.L. YEUNG^{2,6}, CHENG-TE YAO^{3,4},
XIU-HUA TIAN⁵ & SHOU-HSIEN LI²

¹U.S. Geological Survey, Patuxent Wildlife Research Center, National Museum of Natural History, Smithsonian Institution, Washington, DC, 20560 USA

²Department of Life Science, National Taiwan Normal University, 88, Section 4, Tingchou Road, Taipei, 11677 Taiwan, R.O.C.

³Endemic Species Research Institute, Chi-chi, Nantou 552 Taiwan R.O.C.

⁴Department of Life Sciences, National Cheng-kung University, Tainan 701, Taiwan R.O.C.

⁵College of Wildlife, Northeast Forestry University, No.26 Hexing Road, Xiangfang District, Harbin, P. R. China 150040

⁶These authors contributed equally to this work

Abstract

Spoonbills (genus *Platalea*) are a small group of wading birds, generally considered to constitute the subfamily Plataleinae (Aves: Threskiornithidae). We reconstructed phylogenetic relationships among the six species of spoonbills using variation in sequences of the mitochondrial genes *ND2* and cytochrome *b* (total 1796 bp). Topologies of phylogenetic trees reconstructed using maximum likelihood, maximum parsimony, and Bayesian analyses were virtually identical and supported monophyly of the spoonbills. Most relationships within *Platalea* received strong support: *P. minor* and *P. regia* were closely related sister species, *P. leucorodia* was sister to the *minor-regia* clade, and *P. alba* was sister to the *minor-regia-leucorodia* clade. Relationships of *P. flavipes* and *P. ajaja* were less well resolved: these species either formed a clade that was sister to the four-species clade, or were successive sisters to this clade. This phylogeny is consistent with ideas of relatedness derived from spoonbill morphology. Our limited sampling of the Threskiornithinae (ibises), the putative sister group to the spoonbills, indicated that this group is paraphyletic, in agreement with previous molecular data; this suggests that separation of the Threskiornithidae into subfamilies Plataleinae and Threskiornithinae may not be warranted.

Key words: spoonbills, *Platalea*, Threskiornithidae, mitochondrial DNA

Introduction

Spoonbills (genus *Platalea*) are a small group of large, long-legged wading birds characterized by their flat spatulate bills. They are commonly considered to constitute the subfamily Plataleinae in the family Threskiornithidae (e.g., Peters 1931, Steinbacher 1979, Matheu and del Hoyo 1992), formerly placed in the order Ciconiiformes but now considered to be more closely related to or part of the Pelecaniformes (Hackett *et al.* 2008, Chesser *et al.* 2010). The spoonbills are distinguished from the other recognized subfamily of the Threskiornithidae, the Threskiornithinae (ibises), primarily by their distinctive bills. The six species of spoonbills are distributed on all continents except Antarctica (Figure 1): *P. leucorodia* (Eurasian Spoonbill) in Europe, central and eastern Asia south to India, and northern and equatorial Africa; *P. minor* (Black-faced Spoonbill) along the coast of eastern Asia in Korea, northeastern China, Japan, and Taiwan, south to Vietnam and the Philippines; *P. alba* (African Spoonbill) in Africa and Madagascar; *P. regia* (Royal Spoonbill) primarily in Australia, but also in New Zealand, Wallacea, New Guinea, and nearby islands; *P. flavipes* (Yellow-billed Spoonbill) in Australia; and *P. ajaja* (Roseate Spoonbill) in South and Middle America, the Caribbean, and the southeastern USA (Hancock *et al.* 1992; Matheu and del Hoyo 1992).