

Ithaginini, a new family-group name for the Blood Pheasant *Ithaginis cruentus* and resurrection of Lerwini for the Snow Partridge *Lerwa lerwa* (Phasianidae)

George Sangster, Steven M.S. Gregory & Edward C. Dickinson

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ABSTRACT: Recent phylogenetic studies have agreed that the Snow Partridge *Lerwa lerwa* and the Blood Pheasant *Ithaginis cruentus* should be placed in Phasianinae as the successive sister taxa to all other members of this clade. We suggest that each of these species should be recognized as a separate tribe. The family-group name Lerwini von Boetticher, 1939 is here resurrected for *Lerwa lerwa*. We also show that the family-group name Ithagininae Wolters, 1976, is unavailable for *Ithaginis cruentus*. We therefore describe a new family-group name Ithaginini.

KEYWORDS: Galliformes, Phasianidae, Phasianinae, Ithaginini, Lerwini, phylogeny, new tribe.

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Phylogenetic analyses of multi-locus and genomic DNA sequence data of the pheasant family have uncovered three major clades in Phasianidae Horsfield, 1821 (Kimball *et al.*, 2011; Wang Ning *et al.*, 2013; Hosner *et al.*, 2016; Wang Ning *et al.*, 2017; Chen De *et al.*, 2021; Kimball *et al.*, 2021). These are: (i) Rollulinae Bonaparte, 1850 (hill partridges and allies); (ii) Phasianinae, a clade that includes species that are able to rapidly erect fleshy ornaments (turkeys, grouse, tragopans, “true” pheasants, and allies); and (iii) Pavoninae Horsfield, 1821, a clade of species with non-erectile fleshy ornaments (peafowl, francolins, quails, junglefowls, snowcocks, and allies).

SYSTEMATICS OF *LERWA* AND *ITHAGINIS*

Recent phylogenetic studies have resolved the position of the Snow Partridge *Lerwa lerwa* (Hodgson, 1833) and the Blood Pheasant *Ithaginis cruentus* (Hardwicke, 1821), and placed these in the clade of species with erectile fleshy traits (Phasianinae). Three multilocus phylogenetic studies have included *I. cruentus* but not *L. lerwa*. Kimball *et al.* (2011) reconstructed phylogenetic relationships among 170 galliform species using two mitochondrial markers and four nuclear introns. Wang Ning *et al.* (2013) used sequences of two mitochondrial markers and six nuclear introns of 88 species of Galliformes, and Stein *et al.* (2015) assessed DNA sequence data from 9 mitochondrial and 5 nuclear markers, encompassing 225 extant galliform species. These studies found that *I. cruentus* was sister to all other members of the ‘erectile’ clade.

The first phylogenomic study to include *L. lerwa* was based on 4817 genome-wide ultra-conserved elements (UCEs) from 90 galliform taxa (Hosner *et al.*, 2016). In this study, *Lerwa lerwa* was sister to all other members of the ‘erectile’ clade. *Ithaginis cruentus* was not included.

Three further phylogenomic studies using UCE data included both *I. cruentus* and *L. lerwa*: Wang Ning *et al.* (2017) used 3692 UCEs from 20 galliform species, Chen De *et al.* (2021) included

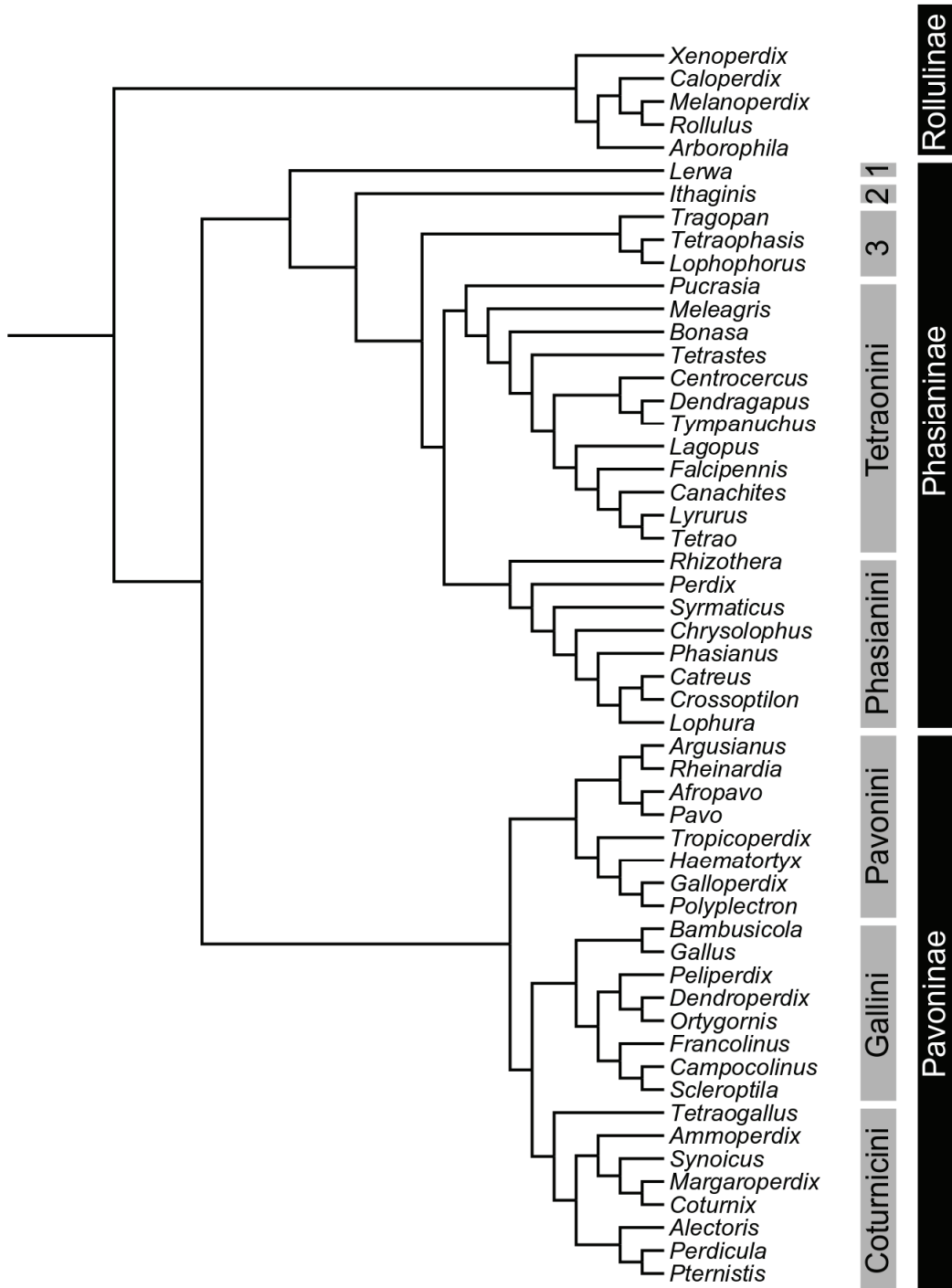


Figure 1. Genus-level phylogeny of Phasianidae based on Kimball *et al.* (2021) showing positions of *Lerwa* and *Ithaginis* and indicating subfamilies (black bars) and tribes (grey bars) recognised in this study. 1, Lerwini; 2, Ithaginini; 3, Lophophorini.

5026 UCEs in their analysis of 130 galliform species, and Kimball *et al.* (2021) employed a supermatrix comprising 4500 UCEs and mitochondrial and nuclear sequences of 265 galliform species (summarized in Figure 1). These three studies congruently showed that *I. cruentus* and *L. lerwa* are successive sister taxa to all other members of the ‘erectile’ clade.

CLASSIFICATION OF *LERWA* AND *ITHAGINIS*

We used the phylogeny by Kimball *et al.* (2021), which is the most complete and best supported phylogeny of Phasianidae, to construct a rank-based classification that recognises three subfamilies and eight tribes. Each of these clades was strongly supported by the data. The phylogeny was transformed into a linear sequence based on the convention that, at each bifurcation in the phylogeny, the least speciose clade is listed first. Numbers of recognised species were derived from Gill *et al.* (2023). Whenever two sister taxa contained the same number of species, the taxa were listed alphabetically (e.g., *Lyrurus* and *Tetrao*, which both contain two species).

Family Phasianidae Horsfield, 1821

Subfamily Rollulinae Bonaparte, 1850 (1848) (*Xenoperdix*, *Caloperdix*, *Melanoperdix*, *Rollulus*, *Arborophila*; 24 spp.)

Subfamily Phasianinae Horsfield, 1821 (“erectile clade”; 64 spp.)

Tribe Lerwini von Boetticher, 1939 (*Lerwa*; 1 sp.)

Tribe Ithaginini [unnamed tribe] (*Ithaginis*; 1 sp.)

Tribe Lophophorini G.R. Gray, 1841 (*Tragopan*, *Tetrao*, *Lophophorus*; 10 spp.)

Tribe Tetraonini Leach, 1819¹ (*Pucrasia*, *Meleagris*, *Bonasa*, *Tetrastes*, *Centrocercus*, *Dendragapus*, *Tympanuchus*, *Lagopus*, *Falcipennis*, *Canachites*, *Lyrurus*, *Tetrao*; 22 spp.)

Tribe Phasianini Horsfield, 1821 (*Rhizothera*, *Perdix*, *Syrnaticus*, *Chrysolophus*, *Phasianus*, *Catreus*, *Crossoptilon*, *Lophura*; 30 spp.)

Subfamily Pavoninae Horsfield, 1821 (“non-erectile clade”; 99 spp.)

Tribe Pavonini Horsfield, 1821 (*Argusianus*, *Rheinardia*, *Afropavo*, *Pavo*, *Tropicoperdix*, *Haematoryx*, *Galloperdix*, *Polyplectron*; 21 spp.)

Tribe Gallini Billberg, 1828 (*Bambusicola*, *Gallus*, *Peliperdix*, *Dendroperdix*, *Ortygornis*, *Francolinus*, *Campocolinus*, *Scleroptila*; 26 spp.)

Tribe Coturnicini Reichenbach, 1848 (*Tetraogallus*, *Ammoperdix*, *Synoicus*, *Margaroperdix*, *Coturnix*, *Alectoris*, *Perdicula*, *Pternistis*; 52 spp.)

Genera *Incertae Sedis*

Ophryisia (1 sp.)

Anurophasis (1 sp.)

This classification shows that the name Phasianidae (*sensu* Sibley & Monroe, 1990; Dickinson & Remsen, 2013) is maintained for all living Galliformes except megapodes (Megapodiidae), curassows and allies (Cracidae), guineafowl (Numidae) and New World quail (Odontophoridae). Within the Phasianidae, the name Phasianinae is used for the clade that includes all species with erectile fleshy traits (as in the type genus *Phasianus*), and including the well-known Tribes Phasianini and Tetraonini. However, the two most divergent lineages of

¹ The tribe Tetraonini Leach, 1819, is included in the subfamily Phasianinae Horsfield, 1821, and in the family Phasianidae Horsfield, 1821, even though on priority alone the names of the subfamily and family would be ‘Tetraoninae’ and ‘Tetraonidae’, respectively. However, Phasianinae Horsfield, 1821 and Phasianidae Horsfield, 1821 are in prevailing use at the level of subfamily and family, respectively, and thus are not displaced by the lower-rank name Tetraonini Leach, 1819 (Article 35.5; ICZN, 1999).

Phasianinae, i.e., *Lerwa lerwa* and *Ithaginis cruentus*, are then without rank and so are best treated as tribes. Recognition of these tribes is further supported by their unique combinations of morphological character states (as described below).

NOMENCLATURE OF *LERWA* AND *ITHAGINIS*

Bock (1994) listed Lerwini von Boetticher, 1939, as an available family-group name. Von Boetticher (1939: 290) discussed the affinities of *L. lerwa* and introduced the new family-group name Lerwinae but did not provide a description or diagnosis for this taxon. However, he referred to a previous paper in which he did describe the characters of *L. lerwa* (von Boetticher, 1930). By doing so, von Boetticher (1939) satisfied Article 13.1.2 (ICZN, 1999: 17) and made the name Lerwinae available. Thus, the family-group name for *Lerwa lerwa* is:

Lerwini von Boetticher, 1939

Diagnosis: Large partridge (300–330 mm) that differs from all other Galliformes by the combination of the following character states: (i) plumage sexually non-dimorphic; (ii) tarsus with only one pair of (blunt) spurs; (iii) presence of bright red ‘button’ over the nostril (an adaptation to cold); (iv) tarsus short; (v) toes fat-padded (an adaptation to cold); (vi) presence of enlarged scales along the sides of part of the mid toe; (vii) bill and legs red; (viii) head, neck, and upperparts finely barred black and white, with some chestnut on scapulars and wing-coverts; and (ix) underparts chestnut with coarse white streaks (Hodgson, 1837; Ogilvie-Grant, 1893; von Boetticher, 1930; Rasmussen & Anderton, 2005; Figure 2).

Type genus: *Lerwa* Hodgson, 1837.

Contents: *Lerwa lerwa* (Hodgson, 1833) is the sole species.

Zoobank LSID for Lerwinae: 6E63779D-0EA8-44E8-BD9D-1DDDC644FF61



Figure 2. Snow Partridge *Lerwa lerwa*, Tungnath, Uttarakhand, India, 28 March 2013 [Kalyan Singh Sajwan/iNaturalist CC-BY-NC].

The family group name for *Ithaginis cruentus* is more problematic. ‘Ithagininae’, as used by Wolters (1976: 102), was listed by Bock (1994) as an available family-group name. Wolters (1976) did not include a description or diagnosis for this taxon and did not refer to a work in which such data are included, rendering the name Ithagininae Wolters, 1976 unavailable (Article 13.1; ICZN, 1999: 17). To make a family-group name available under Article 13.1.1 (ICZN, 1999) and Article 16.1 (ICZN, 1999: 19), we propose:

Ithaginini new tribe

Diagnosis: Rather small pheasant (males 380–410 mm, females 360–390 mm) that differs from all other Galliformes by the combination of the following character states: (i) bill with small, grouse-like tip (adapted for nipping over-wintering buds); (ii) males with multiple spurs; (iii) plumage very dense (i.e., cold-adapted); (iv) body feathers very long and lanceolate; (v) occipital crest short; (vi) tail short, square and unmarked; (vii) legs reddish; (viii) plumage strongly sexually dimorphic; (ix) male (Figure 3) with cere and facial skin red; (x) chin and throat blood-red in some subspecies; (xi) foreneck black-streaked; (xii) plumage boldly pale shaft-streaked; (xiii) upperparts and wings grey with, in some subspecies, pale green colouration in wing coverts and red streaks to base of greyish tail; (xiv) underparts pale lime-green; (xv) undertail-coverts red; (xvi) female mainly uniform warm brown but with greyish body coloration in some subspecies; (xvii) crest and nape grey; (xviii) forehead, face and throat orange-rufous; and (xix) underparts tinged orange-rufous with indistinct pale shaft-streaks (Ogilvie-Grant, 1893; Rasmussen & Anderton, 2005; McGowan *et al.*, 2020).

Type genus: *Ithaginis* Wagler, 1832.

Contents: *Ithaginis cruentus* (Hardwicke, 1821) is the sole species.

Zoobank LSID for new tribe: 00A21A2D-C54D-4222-A716-4E6245741B9C



Figure 3. Blood Pheasant *Ithaginis cruentus*, male, Thrumshing La road, Bumthang, Bhutan, 29 April 2015 [Thibaud Aronson/iNaturalist CC-BY-SA].

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Addresses

George Sangster (✉), Naturalis Biodiversity Center, Darwinweg 2, PO Box 9517, 2300 RA Leiden, the Netherlands.

e-mail: g.sangster@planet.nl.

Steven M.S. Gregory, 35 Monarch Road, Northampton NN2 6EH, UK.

e-mail: sgregory.avium@ntlworld.com.

Edward C. Dickinson, Flat 19, Marlborough Court, Southfields Road, Eastbourne, East Sussex BN21 1BT, UK.

e-mail: ecdickinson13@gmail.com.