

## Supplementary Online Materials

### **A new species of nightjar (*Caprimulgus*) from Timor and Wetar, Lesser Sunda Islands, Wallacea**

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## Supplementary discussion

### Diagnosis: DNA

Compared with a *cyt b* sequence of the holotype of *C. meesi*, *C. ritae* shows unique nucleotides at positions 124C (T in *C. meesi*), 144C (T), 150G (A), 154T (C), 159C (A), 181A (G), 183C (T), 189C (T), 198C (T), 210C (A), 219C (T), 222A (G), 225G (A), 264T (C), 270T (C), 288C (T), 354C (T), 393C (T), 429G (A), 492A (G), 579T (C), 588T (C), 672T (C), 676T (A), 678C (T), 699C (T), 729T (C), 751T (C), 759T (C), 783T (C), 791T (C), 877C (T), 888T (C), 894C (A), 898C (T), 909A (G), 912T (A), 915C (T), 930G (A), 963T (C), 995C (A), 1001C (T), 1017A (G), 1038T (C), 1053T (C), 1056C (T), 1060C (T), 1069C (T), 1072G (A), 1104C (T), 1116G (A), 1134A (C).

Compared with 31 *cyt b* sequences of *C. macrurus*, *C. ritae* shows unique nucleotides at positions 127A (G in *C. macrurus*), 144C (T), 154T (C), 219C (T), 225G (A), 231C (T), 235T (C), 246T (C), 288C (T), 354C (T), 384C (T), 396C (T), 438T (C), 441T (C), 462C (T), 564C (T), 573T (C), 701C (T), 729T (C), 751T (C), 783T (C), 790A (G), 798C (T), 819G (A), 831T (C), 843T (C), 879G (A), 888T (C), 912T (A), 927T (C), 930G (A), 960C (T), 961C (T), 963T (C), 989C (T), 995C (A), 1001C (T), 1002C (T), 1068T (C), 1069C (C/T), 1072G (A), 1074C (A), 1083C (T), 1110C (T), 1116G (A), 1119T (C).

### Ecology and behaviour: additional details

In West Timor, *C. ritae* has been recorded from 30–1500 m in evergreen forest, tropical dry deciduous and montane *Eucalyptus urophylla* open forest in May–July (Noske and Saleh 1996), August (BFK, Hendriks 2008), September (BFK), and October (Verbelen 1996). The forest at Oel Nasi is an open secondary deciduous forest and *C. ritae* was present in forest edge at a large clearing. Near Kapan, *C. ritae* was found at the edge of scruffy secondary forest rather than in nearby evergreen forest.

In Timor-Leste, *C. ritae* was recorded from sea level to 510 m in primary evergreen forest, coastal evergreen swamp forest, through to dry deciduous forest; common in secondary forests, with a single record from degraded savanna (adjacent to dry forest). Along the Laleia River, *C. ritae* co-occurred with *C. affinis*—this was a lowland savanna area with dense groves of tall *Casuarina* (approximating tropical forest structure) interspersed with dry rice fields and an open stream channel. Unrecorded from montane habitat, with the caveat that substantial surveys only occurred at a single montane site. All records were of birds calling before, at and shortly after dusk and before dawn (with limited sampling in the middle of the night). Records spanned six months (March, May, September, October, November and December), with a notable absence of records from June to August. Up to 15 individual birds were estimated to be calling at dusk along the edge of secondary forest over 2–3 ha at one site (Assalaino). Birds generally called alone, in duets, with pairs of birds often calling from close proximity 30–50 m apart.

Visits by CRT in April, September and December (a total of 20 nights) to Mount Mundo Perdido, a montane site in Timor-Leste with patches of tropical evergreen montane forest (1200–1420 m), produced no records of nightjars. Similarly, no nightjars were heard or observed below Mount Ramelau (1900–2000 m) during 12

nights in December, April and July, and at Mount Legumau, Lautem District (900-1100 m) in good primary and secondary evergreen forest during six nights in March and October. Although more search effort is needed in montane areas, we suspect that *C. ritae* prefers lowland habitats (<1,000 m).

In Wetar, CRT recorded *C. ritae* at elevations of 100-1000 m in primary evergreen through to dry deciduous forest. *C. ritae* was mostly heard calling around dusk and before dawn from mid-strata (3-8+ m). BFK recorded nightjars at elevations of 30-230 m in scruffy open secondary mixed deciduous and evergreen forest and its edge. All observations were made in the calling/feeding period following sunset or preceding sunrise. No daytime observations were made. *Caprimulgus ritae* responded vocally to playback of songs from Timor.

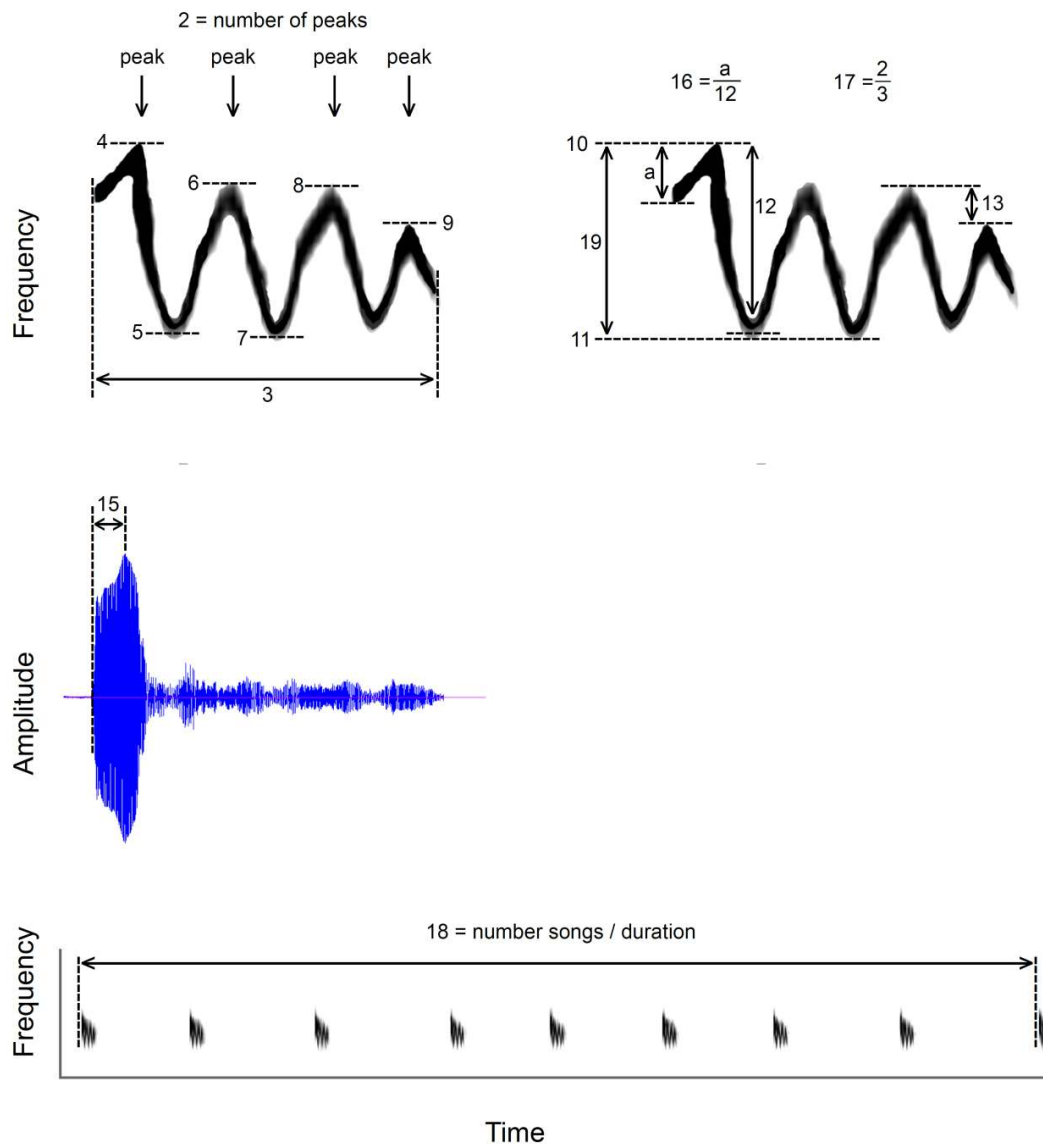
## Biogeography

Recent taxonomic revisions of the *C. macrurus* complex have uncovered a unique biogeographic pattern: two vocally similar groups (one formed by *C. m. albonotatus*, *C. m. bimaculatus*, *C. m. johnsoni*, *C. m. salvadorii*, and *C. m. macrurus* in mainland Asia and western Indonesia and the other by *C. m. schlegelii* in the Molluccan islands and Australasia) that are geographically separated by four vocally distinct species (*C. manillensis*, *C. celebensis*, *C. meesi*, *C. ritae*) (Mees 1985, Rozendaal 1990, Sangster & Rozendaal 2004, this study). ‘Leapfrog’ patterns in the vocalizations of birds have been documented in several other species complexes (Cadena *et al.* 2011, Rheindt *et al.* 2011). The molecular phylogenetic evidence (Fig. 2) suggests that one of the two major areas currently inhabited by *C. macrurus* (Fig. 1) likely has been colonised recently from the other area. This is further supported by the extreme similarity of their vocalizations, as shown by the widely overlapping ranges in all acoustic variables (Sangster & Rozendaal 2004). However, the direction and route of this possible case of long-distance dispersal is unclear.

## Supplementary References

- Cadena, C.D., Cheviron, Z.A. & Funk, W.C. 2011. Testing the molecular and evolutionary causes of a ‘leapfrog’ pattern of geographical variation in coloration. *J. Evol. Biol.* **24**: 402–414.
- Rheindt, F.E., Eaton, J.A. & Verbelen, F. 2011. Vocal trait evolution in a geographic leapfrog pattern: speciation in the Maroon-chinned Fruit Dove (*Ptilinopus subularis*) complex from Wallacea. *Wilson J. Ornithol.* **123**: 429–440.

## Supplementary figure



**Figure S1.** Measurement of vocal character states. Numbers refer to characters. (1) number of notes in a song (not depicted here); (2) number of peaks in a song; (3) total song duration (measured from start of first element to end of last element); (4) maximum frequency of first peak; (5) minimum frequency of first low; (6) maximum frequency of second peak; (7) minimum frequency of second low; (8) maximum frequency of penultimate peak; (9) maximum frequency of last peak; (10) maximum frequency, which is the highest frequency present; (11) minimum frequency, which is the lowest frequency present; (12) frequency drop of first downward element; (13) frequency drop between penultimate and last peak, the ‘drop’ can be a positive or a negative value, in the latter case the last peak has a higher frequency than the penultimate peak; (14) peak frequency, which is the frequency with the highest amplitude (not depicted here); (15) peak frequency time, which is the point in time (measured from start of song) with the highest amplitude; (16) structure of first element, calculated by dividing the frequency range of the first element by the frequency range of the second element, rounded to the nearest 0.05; (17) song pace, which is the number of peaks divided by total song duration; (18) bout pace, which is the number of songs divided by the duration of the bout; if a sound file contains several cuts, the longest uninterrupted bout was selected; (19) frequency range.

## Supplementary tables

**Table S1.** Collection and locality data for newly generated sequences in this study.

<b>Taxon</b>	<b>Locality</b>	<b>Lab ID</b>	<b>Collection no.</b>	<b>GenBank acc. no.</b>
<i>C. macrurus bimaculatus</i>	VIETNAM: C. Annam	GS66	NRM90172931	ON109348
<i>C. macrurus bimaculatus</i>	VIETNAM: S. Annam	GS65	NRM90172930	ON109351
<i>C. macrurus bimaculatus</i>	VIETNAM	GS43	NRM90172926	ON109355
<i>C. macrurus bimaculatus</i>	THAILAND: N. Thailand	GS44	NRM90172915	ON109349
<i>C. macrurus bimaculatus</i>	THAILAND: N. Thailand	GS63	NRM90172913	ON109350
<i>C. macrurus bimaculatus</i>	THAILAND: S. Thailand	GS64	NRM90172925	ON109352
<i>C. macrurus bimaculatus</i>	INDONESIA: Sumatra	GS41	NRM90172924	ON109353
<i>C. macrurus bimaculatus</i>	INDONESIA: Sumatra	GS69	RMNH.AVES.3894	ON109354
<i>C. macrurus macrurus</i>	INDONESIA: Bali	GS92	RMNH.AVES.10104	ON109356
<i>C. macrurus macrurus</i>	INDONESIA: Java	GS71	RMNH.AVES.82133	ON109357
<i>C. macrurus macrurus</i>	INDONESIA: Java	GS72	RMNH.AVES.82134	ON109358
<i>C. macrurus macrurus</i>	INDONESIA: Salayer	GS73	RMNH.AVES.199478	ON109359
<i>C. macrurus salvadorii</i>	INDONESIA: Kalimantan	GS70	RMNH.AVES.199463	ON109360
<i>C. macrurus schlegelii</i>	INDONESIA: Aru Is	GS91	RMNH.AVES.199524	ON109361
<i>C. macrurus schlegelii</i>	INDONESIA: Bacan	GS84	RMNH.AVES.199510	ON109362
<i>C. macrurus schlegelii</i>	INDONESIA: Batanta	GS39	NRM90172933	ON109363
<i>C. macrurus schlegelii</i>	INDONESIA: Batanta	GS81	RMNH.AVES.22702	ON109364
<i>C. macrurus schlegelii</i>	INDONESIA: Halmahera	GS85	RMNH.AVES.199517	ON109365
<i>C. macrurus schlegelii</i>	INDONESIA: Kai Is	GS37	NRM90172937	ON109366
<i>C. macrurus schlegelii</i>	INDONESIA: Papua	GS87	RMNH.AVES.42780	ON109367
<i>C. macrurus schlegelii</i>	INDONESIA: Papua	GS88	RMNH.AVES.42481	ON109368
<i>C. macrurus schlegelii</i>	INDONESIA: Papua	GS89	RMNH.AVES.199536	ON109369
<i>C. macrurus schlegelii</i>	INDONESIA: Papua	GS90	RMNH.AVES.199532	ON109370
<i>C. macrurus schlegelii</i>	PAPUA NEW GUINEA	GS40	NRM543993	ON109371
<i>C. macrurus schlegelii</i>	AUSTRALIA: Queensland	GS38	NRM90172938	ON109372
<i>C. macrurus schlegelii</i>	INDONESIA: Seram	GS78	RMNH.AVES.199505	ON109373
<i>C. macrurus schlegelii</i>	INDONESIA: Ternate	GS82	RMNH.AVES.199523	ON109374
<i>C. macrurus schlegelii</i>	INDONESIA: Vogelkop, Papua	GS69	NRM90172935	ON109375
<i>C. macrurus schlegelii</i>	INDONESIA: Vogelkop, Papua	GS70	NRM90172936	ON109376
<i>C. atripennis aequabilis</i>	SRI LANKA	GS65	RMNH.AVES.4951	ON109377
<i>C. ritae</i> HOLOTYPE	INDONESIA: Wetar	GS86	RMNH.AVES.162472	ON109379
<i>C. ritae</i>	TIMOR-LESTE: Assalaino	CRT1	RMNH.5070058	ON109378
<i>C. meesi</i> HOLOTYPE	INDONESIA: Nisar, Flores	GS233	RMNH.AVES.75297	ON109380

**Table S2.** Primers used for PCR amplification and sequencing. Melting temperatures are indicated.

Cytb-L14990a	CCATCCAACATCTCAGCATGATG	Tm=55.3
Cytb-CapriR290	TATAGGCCTCGTCCAATGTGG	Tm=54.4
Cytb-CapriF269	TACACGCAAACGGAGCCTCATT	Tm=54.8
Cytb-CapriR471	CTCATTCTACAAGGGTTTGGCC	Tm=54.8
Cytb-CapriF432	AGGACAAATATCATTCTGAGGGGC	Tm=55.7
Cytb-CapriR660	TAGGGAGAAGTAGGGGTGGAA	Tm=54.4
Cytb-CapriF651	CTAGGAATCGTATCAAACCTGCGA	Tm=53.5
Cytb-CapriR857	AGGACTCCTCCTAGTTTGTGTTG	Tm=53.0
Cytb-CapriF852	TGCATATGCTATCCTGCGCTC	Tm=54.4
Cytb-CapriR1075	TAGGATTAGGAGGATAGTGAAGTA	Tm=52.3
Cytb-CapriF1043	AGCCAACCAGTAGAACACCCATT	Tm=55.3
Cytb-H16060	TTTGGYTTACAAGACCAATG	Tm=54.3

**Table S3.** Recording localities and recordists. An asterisk means that an uncompressed (non-lossy) version of the recording was analysed.

<b>Taxon</b>	<b>Locality</b>	<b>Recordist</b>	<b>Source</b>
<i>C. affinis affinis</i>	INDONESIA: Kuta, Bali	G. Sangster	XC643733*
<i>C. affinis kasuidori</i>	INDONESIA: Umalulu, East Sumba	G. Sangster	XC643735*
<i>C. affinis timorensis</i>	INDONESIA: near Soe, Timor	B.F. King	ML358079361
<i>C. andamanicus</i>	INDIA: Middle Andaman Island, Andaman Islands	P. Singh	Unpublished
	INDIA: Barathang Island, Andaman Islands	P. Singh	Unpublished
	INDIA: Little Andaman Island, Andaman Islands	P. Singh	Unpublished
	INDIA: Chidiya Tapu (KM2), South Andaman	O. Campbell	XC341291
	INDIA: Munda Pahar, Chidiya Tapu, South Andaman	M. Demko	XC355990
	INDIA: South Andaman	E. Vercuyse	XC394601
	INDIA: Chidiya Tapu, South Andaman	S. Pakapinyo	XC496071
<i>C. atripennis aequabilis</i>	SRI LANKA: Lahogala	R.K. Templeton	BLSA 11979
	SRI LANKA: Wirawila	B.F. King	Marshall (1978)
	SRI LANKA: Yala National Park	S. Smith	Ranft & Cleere (1998)
	SRI LANKA: Udawalawe National Park	D. Warakagoda	Warakagoda (2001)
<i>C. atripennis atripennis</i>	SRI LANKA: Polonnaruwa	D. Warakagoda	AV6570
	INDIA: Baga Hills, Goa	H. Jännes	Jännes (2002)
	INDIA: Nagarhole National Park, Karnataka	D. Farrow	Unpublished
	INDIA: Thrissur, Kerala	P. Singh	Unpublished
	INDIA: Periyar, Kerala	C. Chappuis	Chappuis et al. (2008)
	INDIA: Mudulamai National Park, Tamil Nadu	H. Jännes	Jännes (2002)
	INDIA: Indira Gandhi Wildlife Reserve, Tamil Nadu	R. Drijvers	BLSA 67503
	INDIA: Indira Gandhi Wildlife Reserve, Tamil Nadu	D. Farrow	Unpublished
	INDIA: Indira Gandhi Wildlife Reserve, Tamil Nadu	P. Holt	BLSA 45210
	INDIA: Indira Gandhi Wildlife Reserve, Tamil Nadu	P. Singh	Unpublished
	INDIA: Anaimalai Wildlife Sanctuary, Tamil Nadu	R. Drijvers	Scharringa (2005)
	INDIA: Mukhurt National Park, Tamil Nadu	B.F. King	ML 578
	INDIA: Chandaka-Dampara Wildlife Reserve, Orissa	P. Singh	Unpublished
	INDIA: Chandaka-Dampara Wildlife Reserve, Orissa	P. Singh	Unpublished
<i>C. celebensis celebensis</i>	INDIA: Durgapur, West Bengal	M. Gauntlett	BLSA 04837
	INDONESIA: Tangkoko Batu Angus - Dua Saudara National Park, Sulawesi	C. Carter	BLSA 113131
	INDONESIA: Tangkoko Batu Angus - Dua Saudara National Park, Sulawesi	M. Catsis	XC18816
	INDONESIA: Tangkoko Batu Angus - Dua Saudara National Park, Sulawesi	R. Drijvers	BLSA 72248
	INDONESIA: Tangkoko Batu Angus - Dua Saudara National Park, Sulawesi	F. Verbelen	AV491
	INDONESIA: Tangkoko Batu Angus - Dua Saudara National Park, Sulawesi	P.C. Rasmussen	AV493
	INDONESIA: Tangkoko Batu Angus - Dua Saudara National Park, Sulawesi	P.C. Rasmussen	AV3271
	INDONESIA: Tangkoko Batu Angus - Dua Saudara National Park, Sulawesi	F.G. Rozendaal	Unpublished
	INDONESIA: Tangkoko Batu Angus - Dua Saudara National Park, Sulawesi	F.G. Rozendaal	Unpublished
	INDONESIA: Tangkoko Batu Angus - Dua Saudara National Park, Sulawesi	F.G. Rozendaal	Unpublished
	INDONESIA: Manado, Sulawesi	D. Farrow	Unpublished
	INDONESIA: Lore Lindu National Park, Sulawesi	P. Morris	Unpublished
	INDONESIA: Morowali Reserve, Sulawesi	D. Watling	Unpublished



<b>Taxon</b>	<b>Locality</b>	<b>Recorder</b>	<b>Source</b>	
<i>C. celebensis jungei</i>	INDONESIA: east of Maligano, Buton	J.G. Corbett	BLSA 68086	
	INDONESIA: Mangole Island, Sula Is.	D. Yong	Unpublished	
	<i>C. ritae</i>	INDONESIA: near Kapan, West Timor	B.F. King	ML358100641
		INDONESIA: near Kapan, West Timor	B.F. King	ML358090561
	INDONESIA: Ilway, Wetar	B.F. King	ML358113981	
	INDONESIA: Ilway, Wetar	B.F. King	ML358111061	
	INDONESIA: Lake Tihu, Wetar	C.R. Trainor	ML359215041	
	INDONESIA: Lake Tihu, Wetar	C.R. Trainor	ML359215061	
	INDONESIA: Lake Tihu, Wetar	C.R. Trainor	ML359215091	
	INDONESIA: Lake Tihu, Wetar	C.R. Trainor	ML423362251	
	INDONESIA: Lake Tihu, Wetar	C.R. Trainor	ML423362351	
	INDONESIA: Lake Tihu, Wetar	C.R. Trainor	ML423362631	
	INDONESIA: Lake Tihu, Wetar	C.R. Trainor	ML423362391	
	INDONESIA: Lake Tihu, Wetar	C.R. Trainor	ML423362371	
	INDONESIA: Lake Tihu, Wetar	C.R. Trainor	ML423362311	
	INDONESIA: Wetar	M. Nelson	XC204788	
	TIMOR-LESTE: Muapitine ridge, Muapitine, Lautem	C.R. Trainor	ML359207891	
	TIMOR-LESTE: Muapitine ridge, Muapitine, Lautem	C.R. Trainor	ML359207881	
	TIMOR-LESTE: Muapitine ridge, Muapitine, Lautem	C.R. Trainor	ML359207791	
	TIMOR-LESTE: Muapitine ridge, Muapitine, Lautem	C.R. Trainor	ML359207641	
	TIMOR-LESTE: near Los Palos, Lautem	F. Lambert	AV4162	
	TIMOR-LESTE: Chin River, Los Palos, Lautem	C.R. Trainor	ML359212391	
	TIMOR-LESTE: Chin River, Los Palos, Lautem	C.R. Trainor	ML359212401	
	TIMOR-LESTE: Chin River, Los Palos, Lautem	C.R. Trainor	ML423370781	
	TIMOR-LESTE: Assalaino, Bauro, Lautem	C.R. Trainor	ML359208341	
	TIMOR-LESTE: Assalaino, Bauro, Lautem	C.R. Trainor	ML359208351	
	TIMOR-LESTE: Assalaino, Bauro, Lautem	C.R. Trainor	ML423360171	
<i>C. macrurus albonotatus</i>	INDIA: Chandigarh, Haryana	P. Singh	Unpublished	
	INDIA: Corbett National Park, Kumaria, Uttaranchal	C. Chappuis	Chappuis et al. (2008)	
	INDIA: Corbett National Park, Kumaria, Uttaranchal	C. Chappuis	Chappuis et al. (2008)	
	INDIA: Corbett National Park, Kumaria, Uttaranchal	P. Holt	BLSA 65682	
	INDIA: Corbett National Park, Kumaria, Uttaranchal	P. Holt	BLSA 41518	
	INDIA: Corbett National Park, Kumaria, Uttaranchal	J.C. Roché	Breil & Roche (2000)	
	INDIA: Bhitarkanika, Orissa	P. Singh	Unpublished	
	INDIA: Manas National Park, Assam	B. Bertram	BLSA 14875	
	INDIA: Kohora, Assam	B. and L. Coffey	BLSA 14037	
	INDIA: Kaziranga National Park, Assam	H. Jännes	Unpublished	
	NEPAL: Royal Chitwan National Park	S. Connop	Connop (1993)	
	NEPAL: Royal Chitwan National Park	L. Macaulay	ML 111585	
	NEPAL: Pokhara	B. and L. Coffey	BLSA 14009	
	BHUTAN: Hatisar	B. Bertram	BLSA 14876	
	BANGLADESH: West Bhanugach Reserve	S.P. Gittins	BBC MB22 1	
	BANGLADESH: Bandarbon	R. Halder	Halder (2004)	
	<i>C. macrurus bimaculatus</i>	VIETNAM: Buon Luoi, Kon Ha Nung, Gia Lai Province	F. G. Rozendaal	Unpublished
VIETNAM: Nam (Bai) Cat Tien National Park, Dong Nai Province		D. Edwards	XC25980	
VIETNAM: Nam (Bai) Cat Tien National Park, Dong Nai Province		D. Edwards	XC25978	
VIETNAM: Nam (Bai) Cat Tien National Park, Dong Nai Province		B.F. King	ML 91365	
VIETNAM: Nam (Bai) Cat Tien National Park, Dong Nai Province		A. Meijer	Scharringa (2001)	
CAMBODIA: Tmat Boey, Preah Vihear Province		D. Edwards	XC24684	
CAMBODIA: Seima Biodiversity Conservation Area, Mondulkiri		D. Edwards	XC25979	

<b>Taxon</b>	<b>Locality</b>	<b>Recordist</b>	<b>Source</b>
	THAILAND: Salween River, Kanchanaburi Province	J.T. Marshall	Marshall (1978)
	THAILAND: Kaeng Krachan National Park, Phetchaburi Province	D. Farrow	Unpublished
	THAILAND: Khao Sam Roi Yot, Prachuap Khiri Khan Province	T. Luijendijk	Unpublished
	THAILAND: Ban Bang Tiao, Khao Nor Chuchi, Krabi Province	F.G. Rozendaal	Unpublished
	MALAYSIA: Taman Negara National Park, Pahang	R. Drijvers	BLSA 67502
	MALAYSIA: Kuala Selangor, Selangor	A.B. van den Berg	ML 36318
	MALAYSIA: Kuala Selangor, Selangor	A.B. van den Berg	ML 71232
	MALAYSIA: Kuala Selangor, Selangor	F. Verbelen	AV3273
	MALAYSIA: Kuala Selangor, Selangor	G. Sangster	BLSA 254584
	MALAYSIA: Kuala Selangor, Selangor	J. Scharringa	Scharringa (2001)
	MALAYSIA: Kuala Selangor, Selangor	J. Scharringa	Scharringa (2001)
	MALAYSIA: Kuala Lumpur	R. Kersley	BLSA 6215
	MALAYSIA: Kuala Lumpur	R. Kersley	BLSA 6217
	MALAYSIA: Kuala Lumpur	R. Kersley	BLSA 6378
	MALAYSIA: Kuala Lumpur	R. Kersley	BLSA 6898
	MALAYSIA: Kenang, Johor	T.C. White	BLSA 4804
	SINGAPORE	C. Hails	BLSA 33335
	SINGAPORE	P. Morris	BLSA 72621
	SINGAPORE	S. Supari	Supari (2003)
	INDONESIA: Way Kambas, Sumatra	B.F. King	ML358117111
<i>C. macrurus johnsoni</i>	PHILIPPINES: St. Pauls, Palawan	C. Derks	Scharringa (2005)
	PHILIPPINES: St. Pauls, Palawan	A. Greensmith	BLSA 34333
	PHILIPPINES: Puerto Princesa, Palawan	R.S. Kennedy	ML 18590
	PHILIPPINES: near Sabang, Palawan	P. Noakes	XC39679
<i>C. macrurus macrurus</i>	INDONESIA: Carita, Java	A.B. van den Berg	ML70695
	INDONESIA: Carita, Java	A.B. van den Berg	ML70696
	INDONESIA: Carita, Java	A.B. van den Berg	ML71100
	INDONESIA: Muara Angke, Jakarta, Java	D. Holmes	BLSA 13060
	INDONESIA: Depok, Java	S. van Balen	Unpublished
	INDONESIA: Alas Purwo, Java	S. van Balen	Unpublished
<i>C. macrurus salvadorii</i>	MALAYSIA: Pulau Tiga, Sabah	A. Greensmith	BLSA 56509
<i>C. macrurus schlegelii</i>	INDONESIA: Gunung Rinjani National Park, Lombok	G. Sangster	BLSA 254593
	INDONESIA: Gunung Rinjani National Park, Lombok	G. Sangster	BLSA 254594
	INDONESIA: Babar	F. Verbelen	Unpublished
	INDONESIA: Kei Kecil	B.F. King	ML358122411
	INDONESIA: Buru	B.F. King	ML358120081
	INDONESIA: Foli, Halmahera	M. Catsis	XC18866
	INDONESIA: Kali Batu Putih, Halmahera	T. Luijendijk	XC612586*
	INDONESIA: Kali Batu Putih, Halmahera	S. Smith	BLSA 43294
	INDONESIA: Bataka, Halmahera	F.G. Rozendaal	Unpublished
	INDONESIA: Biak	F. Verbelen	AV3272
	PAPUA NEW GUINEA: Mt Hagen	J. C. Roché	BLSA 38402
	PAPUA NEW GUINEA: River Fly	I. Redmond	BLSA 12283
	PAPUA NEW GUINEA: Varirata National Park	F. Lambert	XC24684
	PAPUA NEW GUINEA: near Eiwo, 9.01S, 148.00E	D. Zimmerman	ML20969
	AUSTRALIA: Darwin, Northern Territory	C.R. Trainor	ML423358171
	AUSTRALIA: Darwin, Northern Territory	C.R. Trainor	ML423356151
	AUSTRALIA: Iron Range, Cape York, Queensland	S. Bennett	Buckingham & Jackson (1991)
	AUSTRALIA: Iron Range, Cape York, Queensland	R. Swaby/A. Griffin	Swaby & Griffin (1984)
	AUSTRALIA: Rocky River, McIlwraith Range, Cape York, Queensland	D. Stewart	Stewart (2002)

Taxon	Locality	Recordist	Source
	AUSTRALIA: Murray Falls National Park, Queensland	F. van Gessel	Unpublished
	AUSTRALIA: Broadwater State Forest, near Ingham, Queensland	F. van Gessel	Unpublished
	AUSTRALIA: Broadwater State Forest, near Ingham, Queensland	F. van Gessel	Unpublished
	AUSTRALIA: Broadwater State Forest, near Ingham, Queensland	F. van Gessel	Unpublished
	AUSTRALIA: Mt Spec, Paluma Range, Queensland	H. Pollock	BLSA 72897
	AUSTRALIA: Mt Spec, Paluma Range, Queensland	A. Griffin/R. Swaby	Griffin & Swaby (nd)
	AUSTRALIA: Cape Hillsborough National Park, Queensland	F. van Gessel	Unpublished
	AUSTRALIA: Cape Wilderness Lodge, Queensland	G. Beruldsen	Buckingham & Jackson (1991)
<i>C. manillensis</i>	PHILIPPINES: Mt Arayat, Pampanga, Luzon	J.T. Marshall	Marshall (1978)
	PHILIPPINES: Talustuson, Biliran	R.S. Kennedy	ML 38694
	PHILIPPINES: Rajah Sikatuna National Park, Bohol	P. Morris	BLSA 46725
	PHILIPPINES: Rajah Sikatuna National Park, Bohol	F. Verbelen	AV8849
	PHILIPPINES: Mt Katanglad, Mindanao	C. Derks	Scharringa (2005)
	PHILIPPINES: Mt Katanglad, Mindanao	R. Drijvers	BLSA 54795
	PHILIPPINES: Mt Katanglad, Mindanao	D. Fisher	BLSA 100964
	PHILIPPINES: Mt Katanglad, Mindanao	N. Gardner	BLSA 46607
	PHILIPPINES: Mt Katanglad, Mindanao	N. Gardner	BLSA 46611
	PHILIPPINES: Mt Katanglad, Mindanao	N. Gardner	BLSA 46620
	PHILIPPINES: Mt Katanglad, Mindanao	A. Greensmith	BLSA 34296
	PHILIPPINES: Mt Katanglad, Mindanao	A. Greensmith	BLSA 34297
	PHILIPPINES: Mt Katanglad, Mindanao	P. Morris	BLSA 46725
<i>C. meesi</i>	INDONESIA: Labuhanbajo, Flores	G. Sangster	BLSA 254592
	INDONESIA: Gunung Pakandeki, near Kisol, Flores	C. Carter	NSA 113092
	INDONESIA: Gunung Pakandeki, near Kisol, Flores	A.T. Chartier	XC31355
	INDONESIA: Gunung Pakandeki, near Kisol, Flores	B. F. King	ML358129751
	INDONESIA: Gunung Pakandeki, near Kisol, Flores	F.G. Rozendaal	Unpublished
	INDONESIA: Kisol, Flores	F. Lambert	XC121830
	INDONESIA: Wolo Tado, near Riung, Flores	J. Leadley	BLSA 115044
	INDONESIA: Wolo Tado, near Riung, Flores	G. Sangster	BLSA 254586
	INDONESIA: Wolo Tado, near Riung, Flores	G. Sangster	BLSA 254587
	INDONESIA: Wolo Tado, near Riung, Flores	G. Sangster	BLSA 254589
	INDONESIA: Ili Wengot, Flores	R. Drijvers	BLSA 72310
	INDONESIA: Lewapaku, Sumba	G. Sangster	BLSA 254585
	INDONESIA: Lewapaku, Sumba	F. Verbelen	BLSA 66681
	INDONESIA: Km 70, Lewa-Waikabubak Hwy, Sumba	D.L. Yong	XC638252
	INDONESIA: Nggaha Oriangu, Kabupaten Sumba Timur	D.L. Yong	XC314176
	INDONESIA: Alor	F. Verbelen	Unpublished
	INDONESIA: Alor	S. Cooleman	XC239285
	INDONESIA: Apui, Alor	Gareth K	XC351685

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**Table S4.** List of specimens examined.

<b>Taxon</b>	<b>Locality</b>	<b>Museum</b>	<b>Number, sex</b>
<i>C. andamanicus</i>	INDIA: Port Blair, Andaman Islands	AMNH	2 males
	INDIA: S. Brother Island, Andaman Islands	AMNH	1 male
	INDIA: Andaman Islands	AMNH	1 male, 1 female
<i>C. atripennis aequabilis</i>	SRI LANKA: Kalutara District	RMNH	1 male
	SRI LANKA: Kandy	AMNH	1 male, 1 female
	SRI LANKA: 'west Ceylon'	AMNH	1 male
	SRI LANKA: 'east Ceylon'	AMNH	1 male
	SRI LANKA: 'Ceylon'	AMNH	4 males, 2 females
<i>C. atripennis atripennis</i>	INDIA: Nagargale, Wynaad	RMNH	1 male
	INDIA: Kandy, Karnataka	AMNH	1 male, 3 females
<i>C. ritae</i>	INDONESIA: Camplong, West Timor	AMNH	1 (immature) male
	INDONESIA: Wetar	AMNH	1 male, 1 female
	INDONESIA: Wetar	RMNH	1 female
<i>C. macrurus albonotatus</i>	TIMOR-LESTE: Assalaino	RMNH	1 male
	INDIA: Darjeeling	RMNH	1 male
<i>C. macrurus bimaculatus</i>	VIETNAM: Lambda, S. Annam	NRM	1 female
	VIETNAM: Djirig, S. Annam	NRM	2 males
<i>C. macrurus macrurus</i>	VIETNAM: Dran, S. Annam	NRM	2 females
	VIETNAM: Lao Bao, C. Annam	NRM	1 male
	THAILAND: Meh Yome	NRM	1 male, 1 female
	THAILAND: Pak Koh	NRM	1 male
	THAILAND: Koon Tan	NRM	2 males, 3 females
	THAILAND: Hue Sai	NRM	1 female
	THAILAND: Salanga	RMNH	1 male
	MALAYSIA: Temangoh, Perak	NRM	1 female
	MALAYSIA: Kuala Lumpur, Selangor	NRM	1 male
	MALAYSIA: Malakka	RMNH	1 male
	INDONESIA: 'Sumatra'	RMNH	1 male, 1 female
	INDONESIA: Deli, North Sumatra	RMNH	2 females
	INDONESIA: Medan, North Sumatra	NRM	1 male
	INDONESIA: Medan, North Sumatra	RMNH	2 males
	INDONESIA: Sungai Putih, Serdang, South Sumatra	RMNH	2 males
	INDONESIA: Gunung Kupak, West Java	RMNH	2 males
	INDONESIA: Bolang, West Java	RMNH	2 males
	INDONESIA: Pelabuhan District, West Java	RMNH	1 male
	INDONESIA: Gunung Masigit, West Java	RMNH	4 males, 1 female
	INDONESIA: Cipetir, west of Sukabumi, West Java	RMNH	1 male, 1 female
INDONESIA: Cilangkat, north of Bogor, West Java	RMNH	1 male	
INDONESIA: Jakarta, West Java	RMNH	1 male	
INDONESIA: Kali Bungin, West Java	RMNH	1 female	
INDONESIA: Pasir Kananga, Jampang Tengah, West Java	RMNH	1 male, 2 females	
INDONESIA: Gunung Pangrango, West Java	RMNH	1 male	
INDONESIA: Kalijati, West Java	RMNH	1 male	
INDONESIA: Cilandak, Cibungur, West Java	RMNH	1 male	
INDONESIA: Ciodeng, West Java	RMNH	1 male	
INDONESIA: Banjar, Preanger, West Java	RMNH	4 males	
INDONESIA: Cirebon, West Java	RMNH	2 males, 1 female	
INDONESIA: Gedangan, Semarang, Central Java	RMNH	2 males	
INDONESIA: locality unknown, Java	RMNH	1 female	
INDONESIA: Kuta, Bali	RMNH	1 male	
<i>C. macrurus salvadorii</i>	MALAYSIA: Kuching, Sarawak	RMNH	2 males, 1 female
	INDONESIA: Pontianak, West Kalimantan	RMNH	2 males
<i>C. macrurus schlegelii</i>	INDONESIA: Salayar	RMNH	1 male
	INDONESIA: Toeal, Kai Cecil	AMNH	4 males, 1 female
	INDONESIA: Toeal, Kai Cecil	NRM	1 male
	INDONESIA: Buru	RMNH	3 males, 3 females
	INDONESIA: Ambon	RMNH	3 males
INDONESIA: Seram	RMNH	4 males	

<b>Taxon</b>	<b>Locality</b>	<b>Museum</b>	<b>Number, sex</b>
	INDONESIA: Obi latu	RMNH	1 female
	INDONESIA: southern Halmahera	RMNH	1 male, 1 female
	INDONESIA: Ternate	RMNH	4 males
	INDONESIA: Misool	RMNH	2 males, 2 females
	INDONESIA: Wammer, Aru Is	RMNH	1 male
	INDONESIA: Wailibit, Batanta	RMNH	1 male
	INDONESIA: Wailibit, Batanta	NRM	1 male, 1 female
	INDONESIA: Waihali, Irian Jaya	NRM	2 females
	INDONESIA: Mansinam, Arfak, Irian Jaya	RMNH	1 male
	INDONESIA: Kaukas, Onin Peninsula, Irian Jaya	RMNH	1 male
	INDONESIA: Geitenkamp, Lorentz River, Irian Jaya	RMNH	1 male, 1 female
	INDONESIA: Kloofbivak, Lorentz River, Irian Jaya	RMNH	1 male
	INDONESIA: Alkmaar, Lorentz River, Irian Jaya	RMNH	1 female
	INDONESIA: Ongari, near Kumbe River, Irian Jaya	RMNH	1 female
	INDONESIA: Kurik, Irian Jaya	RMNH	3 females
	INDONESIA: Wanggo, Irian Jaya	RMNH	1 male
	PAPUA NEW GUINEA: Wahgi Valley, Nondugl	NRM	2 males
<i>C. manillensis</i>	AUSTRALIA: Cardwell, Queensland	NRM	1 female
	PHILIPPINES: Bulacan, Luzon	RMNH	1 male
	PHILIPPINES: Vijcaya, Luzon	RMNH	1 male
	PHILIPPINES: Sulang Cairte, Luzon	AMNH	1 male
	PHILIPPINES: Laguna de Bai, Luzon	AMNH	1 male
	PHILIPPINES: 'north Luzon'	AMNH	1 male
	PHILIPPINES: Luzon	AMNH	1 male, 3 females
	PHILIPPINES: Silliman Farm, Negros	RMNH	1 male
	PHILIPPINES: Inalad, Siaton, Negros	RMNH	1 male
<i>C. meesi</i>	INDONESIA: Nisar, Flores	RMNH	1 male
	INDONESIA: Mao Marru, Sumba	AMNH	1 male

**Table S5.** Standardized canonical discrimination function coefficients examining trends in variance of 16 acoustic variables<sup>1</sup> measured for territorial songs of seven species in the *Caprimulgus macrurus* complex. Eigenvalues and percentage of variance accounted for by each factor are given at the bottom of the table.

Variable	DF1	DF2	DF3	DF4	DF5	DF6
1	1.226	0.110	0.678	-0.188	-0.350	-0.049
2	0.596	0.385	-0.817	0.098	0.741	-0.392
3	-0.079	-0.135	-0.003	0.376	0.514	0.644
4	0.128	-0.107	0.863	-0.788	0.661	-0.949
5	0.064	0.082	0.182	0.830	-0.103	-0.115
6	-0.165	-0.042	-0.349	0.404	-0.289	-0.480
7	0.329	0.180	0.299	-0.314	0.075	0.090
8	0.099	-0.391	-0.355	1.177	-0.172	0.600
9	-0.129	0.304	-0.118	-1.137	0.333	-0.624
11	-0.355	0.198	-0.615	-0.175	-0.226	0.803
12	0.245	0.687	-0.202	0.418	-0.538	1.520
14	0.087	0.159	0.124	-0.261	-0.070	0.041
15	0.081	0.194	0.005	0.007	-0.142	-0.022
16	0.128	0.786	-0.117	0.220	-0.409	-0.01
17	0.269	0.008	0.902	0.438	0.187	0.106
18	0.128	-0.036	0.253	0.098	-0.068	0.200
Eigenvalue	144.0	40.1	22.8	5.7	4.2	2.4
% variance explained	65.7	18.3	10.4	2.6	1.9	1.1

<sup>1</sup> Variables 10 (maximum frequency), 13 (frequency drop of penultimate and last peak), and 19 (frequency range) were excluded because these failed the tolerance test.

**Table S6.** Standardized canonical discrimination function coefficients examining trends in variance of 15 acoustic variables<sup>1</sup> measured for territorial songs of *Caprimulgus ritae* sp. nov., *C. meesi*, *C. macrurus* and *C. andamanicus*. Eigenvalues and percentage of variance accounted for by each factor are given at the bottom of the table.

Variable	DF1	DF2	DF3
2	-0.916	-1.276	-0.577
3	1.877	1.003	0.613
4	-0.958	0.237	-0.711
5	0.026	0.251	-0.023
6	0.361	0.524	-1.111
7	-1.222	0.569	-0.084
8	0.432	-0.149	0.598
9	0.022	-0.546	-0.135
11	1.259	-1.006	0.840
12	0.200	-0.161	1.348
14	-0.102	-0.113	0.278
15	0.095	-0.135	0.149
16	0.116	-0.204	-0.032
17	1.015	1.576	0.511
18	-0.058	0.221	0.066
Eigenvalue	52.4	19.7	4.5
% variance explained	68.4	25.7	5.9

<sup>1</sup> Variables 1 (number of notes), 10 (maximum frequency), 13 (frequency drop of penultimate and last peak), and 19 (frequency range) were excluded because these failed the tolerance test.



**Table S7.** Standardized canonical discrimination function coefficients examining trends in variance of 15 morphometric variables measured for males of *Caprimulgus ritae* sp. nov., *C. andamanicus*, *C. meesi* and the four Indonesian subspecies of *C. macrurus* (*C. m. schlegelii*, *C. m. macrurus*, *C. m. salvadorii*, *C. m. bimaculatus*) ( $n = 52$ ). Eigenvalues and percentage of variance accounted for by each factor are given at the bottom of the table.

<b>Variable</b>	<b>DF1</b>	<b>DF2</b>	<b>DF3</b>
P9 emargination from tip	0.021	0.824	-0.325
P8 emargination from tip	0.174	-0.618	-0.240
Shortfall P9	0.098	0.436	0.021
Shortfall P8	0.215	0.134	0.162
Shortfall P7	-0.473	0.091	-0.285
Shortfall P5	0.060	0.140	0.798
Shortfall P4	-0.881	-0.470	-0.551
Shortfall P3	-0.065	-0.463	-2.281
Shortfall P2	0.505	0.366	2.878
Wing (flattened chord)	0.713	1.022	-0.224
Tail	0.179	-0.806	0.010
R5 white R outer web	0.220	-0.449	-0.853
R5 white R inner web	0.100	-0.215	0.033
R4 white R outer web	0.872	-0.115	0.635
R4 white R inner web	-0.633	0.205	0.312
Eigenvalue	2.5	1.1	0.2
% variance explained	67.1	28.8	4.1

**Table S8.** Standardized canonical discrimination function coefficients examining trends in variance of 15 morphometric variables measured for females of *Caprimulgus ritae* sp. nov., *C. andamanicus*, and the four Indonesian subspecies of *C. macrurus* (*C. m. schlegelii*, *C. m. macrurus*, *C. m. salvadorii*, *C. m. bimaculatus*) ( $n = 20$ ). Eigenvalues and percentage of variance accounted for by each factor are given at the bottom of the table.

<b>Variable</b>	<b>DF1</b>	<b>DF2</b>
P9 emargination from tip	-0.055	-2.795
P8 emargination from tip	0.940	-0.159
Shortfall P7	-1.260	0.133
Shortfall P6	3.918	-1.737
Shortfall P5	-4.570	0.812
Shortfall P4	-1.985	3.070
Shortfall P3	4.341	-3.501
Shortfall P2	-0.838	2.131
Wing (flattened chord)	0.651	1.184
Tail	0.990	0.365
Bill length (from anterior point of nostril)	0.662	1.090
R5 outer webs Tail patch	-0.042	3.620
R5 inner webs Tail patch	-1.349	-0.138
R5 inner webs Tail patch	3.397	-2.581
R4 outer webs Tail patch	-2.383	0.246
Eigenvalue	17.461	4.907
% variance explained	78.1	21.9

**Table S9.** Raw morphometric data, males.

Taxon	Sex	Catalogue number	Location	P9 emargination from tip	P8 emargination from tip	Shortfall P10	Shortfall P9	Shortfall P8	Shortfall P7	Shortfall P6	Shortfall P5	Shortfall P4	Shortfall P3
<i>C. ritae</i>	male	AMNH 632998	Wetar	64	59	10	0	0	11	38	52	61	67
<i>C. ritae</i>	male	AMNH 345569	Wetar	66	61	12	1	0	16	43	56	63	69
<i>C. ritae</i>	male	RMNH.5070058	Timore-Leste, Assalaino	64	61	11	1	0	12	38,5	52,5	59,5	63,5
<i>C. m. schlegelii</i>	male	RMNH.AVES.199526	Wammer, Aru Is	69	64	35	2	0	6	40	55	63	69
<i>C. m. schlegelii</i>	male	RMNH.AVES.199527	Mansinam, Arfak	77	73	16	3	0	10		58	77	85
<i>C. m. schlegelii</i>	male	RMNH.AVES.199534	Kaukas, Onin Peninsula	76	71	9	2	0	6	37	55	64	69
<i>C. m. schlegelii</i>	male	RMNH.AVES.199536	Kloofbivak	70	66	8	1	0	11	37		63	70
<i>C. m. schlegelii</i>	male	RMNH.AVES.30098	Wanggo	70	63	12	2	0	9	36	51	60	66
<i>C. m. schlegelii</i>	male	RMNH.AVES.199529	Geitenkamp	73	65	14	0,5	0	9	34	51	60	65
<i>C. m. schlegelii</i>	male	RMNH.AVES.199523	Ternate	72	69	12	1	0	12	40	58	69	72
<i>C. m. schlegelii</i>	male	RMNH.AVES.22702	Batanta	71	67	16	1	0	12	39	54	62	75
<i>C. m. schlegelii</i>	male	RMNH.AVES.199517	zuid Halmahera	70	66	10	2	0	10	39	54	63	71
<i>C. m. schlegelii</i>	male	RMNH Cat. No. 10	Waigama, Misool	74	69	16	2	0	9	38	55	66	72
<i>C. m. schlegelii</i>	male	RMNH Cat. No. 12	Misool	71	63	11	3	0	10	37	53	67	75
<i>C. m. schlegelii</i>	male	RMNH.AVES.199509	Ternate	72	66	11	1	0	12	38	57	69	77
<i>C. m. schlegelii</i>	male	RMNH.AVES.199511	Ternate	74									
<i>C. m. schlegelii</i>	male	RMNH.AVES.199513	Ternate		67				9	41	58	69	77
<i>C. m. schlegelii</i>	male	RMNH.AVES.14996	Ceram	72	67	13	1	0	10	38	57	62	76
<i>C. m. schlegelii</i>	male	RMNH.AVES.199502	Ambon	74	67	14	2	0	11	38	55	67	74
<i>C. m. schlegelii</i>	male	RMNH.AVES.199503	Ambon										
<i>C. m. schlegelii</i>	male	RMNH.AVES.199504	Buru										
<i>C. m. schlegelii</i>	male	RMNH.AVES.199505	Seram	71	65	15	3	0	11	39			
<i>C. m. schlegelii</i>	male	RMNH.AVES.199506	Buru	72	64	13	1	0	11	39	55	65	72
<i>C. m. schlegelii</i>	male	RMNH.AVES.199495	Seram	74	67	14	2	0	11	40	58	67	73
<i>C. m. schlegelii</i>	male	RMNH.AVES.199497	Buru	77	69	13	1	0	10	38	56	65	70
<i>C. m. schlegelii</i>	male	RMNH.AVES.199498	Seram	75	70	15	2	0	11	42	60	70	77
<i>C. m. schlegelii</i>	male	RMNH.AVES.199499	Ambon	75	67	16	2	0	9	35	52	63	69
<i>C. m. schlegelii</i>	male	RMNH Cat. No. 2	Saleyser	74	68	11	0	1	12	41	59	68	76
<i>C. m. macrurus</i>	male	RMNH.AVES.42713	Gng Koepak	76	69	13	1	0	10	40	56	70	74
<i>C. m. macrurus</i>	male	RMNH.AVES.42716	Gng Koepak	80	74		0	1	9	40	58	70	76

Taxon	Sex	Catalogue number	Location	P9 emargination from tip	P8 emargination from tip	Shortfall P10	Shortfall P9	Shortfall P8	Shortfall P7	Shortfall P6	Shortfall P5	Shortfall P4	Shortfall P3
<i>C. m. macrurus</i>	male	RMNH.AVES.42717	Tjiodeng	73	68	10	0	1	12	37	53	62	68
<i>C. m. macrurus</i>	male	RMNH.AVES.42705	Struiswijk, Batavia	73	67	15	1	0	10	40	55	63	69
<i>C. m. macrurus</i>	male	RMNH.AVES.42727	Gng massigit	73	70	14	1	0	10	38	53	62	68
<i>C. m. macrurus</i>	male	RMNH.AVES.42728	Gng Massigit	74	68	15	3	0		41	55	66	73
<i>C. m. macrurus</i>	male	RMNH.AVES.42719	Pangerango	70	68	11	1	0	9	39	54	62	69
<i>C. m. macrurus</i>	male	RMNH.AVES.42723	Gng Massigit	75	70		0	0	8	33	52	64	71
<i>C. m. macrurus</i>	male	RMNH.AVES.199488	Bolang										
<i>C. m. macrurus</i>	male	RMNH.AVES.199491	Gedangan	75	68	12	0	2	10	37	55	64	72
<i>C. m. macrurus</i>	male	RMNH.AVES.10104	Koeta, Bali	75	69	15	1	0	12	38	51	59	67
<i>C. m. macrurus</i>	male	RMNH.AVES.42724	Gng Massigit	70	68	11	0	0	11	39	52	63	68
<i>C. m. macrurus</i>	male	RMNH.AVES.25993	Bolang	68	65	15	3	0	10	35	54	63	70
<i>C. m. macrurus</i>	male	RMNH.AVES.26937	Cheribon										
<i>C. m. macrurus</i>	male	RMNH.AVES.28197	Cheribon										
<i>C. m. macrurus</i>	male	RMNH.AVES.42698	Tjilandak	77	69	14	2	0	10	40	55	67	74
<i>C. m. macrurus</i>	male	RMNH.AVES.42701	Pasir Kananga	69	65	13	1	0	11	38		61	67
<i>C. m. macrurus</i>	male	RMNH.AVES.42702	Distr Palabuhan		69	10		0	7	33	51	61	68
<i>C. m. macrurus</i>	male	RMNH.AVES.42703	Bandjar	70	65	10	1	0	8	33	49	60	68
<i>C. m. macrurus</i>	male	RMNH.AVES.42704	Bandjar	73	65	10	0	1	11	38	55	65	73
<i>C. m. macrurus</i>	male	RMNH.AVES.82134	Kalidjati	75	74	14	1	0	14	43	59	69	76
<i>C. m. macrurus</i>	male	RMNH.AVES.82133	Og. Tjipatir	74	72	8	2	0	8	38	54	65	74
<i>C. m. macrurus</i>	male	RMNH.AVES.66828	Tjilangkat										
<i>C. m. macrurus</i>	male	RMNH.AVES.199490	Gedangan Semarang	73	67	10	0	0	8	33	51	61	68
<i>C. m. macrurus</i>	male	RMNH.AVES.42708	Bandjar	75	71	13	1	0	8	35	55	66	73
<i>C. m. macrurus</i>	male	RMNH.AVES.42709	Bandjar	72	65	12	1	0	10	37	53	63	69
<i>C. m. salvadorii</i>	male	RMNH.AVES.199464	Pontianak, Borneo	72	74	12	1	0	13	42	59	68	76
<i>C. m. salvadorii</i>	male	RMNH.AVES.199463	Pontianak, Borneo	72	65	13	3	0	10	35	51	61	69
<i>C. m. salvadorii</i>	male	RMNH.AVES.35808	Kuching, Borneo	76	69	12	2	0	12		60	66	74
<i>C. m. salvadorii</i>	male	RMNH.AVES.35810	Kuching, Borneo	70	65	13	2	0	12	42	57	65	72
<i>C. m. bimaculatus</i>	male	RMNH.AVES.199448	Malakka	79	79	15	3	0	13	43	63	75	84
<i>C. m. bimaculatus</i>	male	RMNH.AVES.199461	Salanga, Thailand	75	71	15	2	0	13		60	73	80
<i>C. m. bimaculatus</i>	male	RMNH.AVES.14995	Soengai Putih, Sumatra	80	71	18	1	0	9	40	58	70	78
<i>C. m. bimaculatus</i>	male	RMNH.AVES.14994	Soengai Putih, Sumatra										
<i>C. m. bimaculatus</i>	male	RMNH.AVES.199466	Medan	80	76	13	1	0	10		60	71	80

Taxon	Sex	Catalogue number	Location	P9 emargination from tip	P8 emargination from tip	Shortfall P10	Shortfall P9	Shortfall P8	Shortfall P7	Shortfall P6	Shortfall P5	Shortfall P4	Shortfall P3
<i>C. m. bimaculatus</i>	male	RMNH.AVES.199465	Medan										
<i>C. m. bimaculatus</i>	male	RMNH.AVES.199459	Sumatra	75	67	11	1	0	11	39	55	64	71
<i>C. andamanicus</i>	male	AMNH 632908	Bamboo Flat, Port Blair	75	66	15	3	0	11		56	68	76
<i>C. andamanicus</i>	male	AMNH 632909	Port Blair										
<i>C. andamanicus</i>	male	AMNH 632910		75	70		2	0	12	39	54	62	69
<i>C. andamanicus</i>	male	AMNH 632912	South Brother Is.	75	67	15	0,5	0	15	44	60	71	78
<i>C. meesi</i>	male	RMNH.AVES.75297		74	68	9	0	0	13	42	57	66	71
<i>C. meesi</i>	male	AMNH 346702		65	62	9	1	0	10	36	50	59	64

**Table S9.** Raw morphometric data, males, cont.

Taxon	Sex	Catalogue number	Location	Shortfall P2	Shortfall P1	Wing (flattened chord)	Tail	Bill length (from gape)	Bill length (from ant. point of nostril)	R5 white R outer web	R5 white R inner web	R4 white R outer web	R4 white R inner web
<i>C. ritae</i>	male	AMNH 632998	Wetar	71	76	163	118	31	6	32	38	32	34
<i>C. ritae</i>	male	AMNH 345569	Wetar	75	80	161	119	29	7	33	41	36	38
<i>C. ritae</i>	male	RMNH.5070058	Timore-Leste, Assalaino	71	79	163	121	30	7	31	35	31	35
<i>C. m. schlegelii</i>	male	RMNH.AVES.199526	Wammer, Aru Is	75	81	175	132	22		40	45	38	41
<i>C. m. schlegelii</i>	male	RMNH.AVES.199527	Mansinam, Arfak			194	140	25	7	53	55	47	52
<i>C. m. schlegelii</i>	male	RMNH.AVES.199534	Kaukas, Onin Peninsula	75	80	181	137		6	34	38	31	31
<i>C. m. schlegelii</i>	male	RMNH.AVES.199536	Kloofbivak			183	133	22	6	55	52	50	54
<i>C. m. schlegelii</i>	male	RMNH.AVES.30098	Wanggo	72	77	171	134		6	49	49	47	48
<i>C. m. schlegelii</i>	male	RMNH.AVES.199529	Geitenkamp	72	77	180	131	28	8	51	52	50	52
<i>C. m. schlegelii</i>	male	RMNH.AVES.199523	Ternate	81	89	191	141	26	8	48	49	41	42
<i>C. m. schlegelii</i>	male	RMNH.AVES.22702	Batanta	80	85	185	129	29	7	39	44	40	43
<i>C. m. schlegelii</i>	male	RMNH.AVES.199517	Zuid Halmahera	79	83	176	131	30	8	43	48	44	46
<i>C. m. schlegelii</i>	male	RMNH Cat. No. 10	Waigama, Misool	79	87	185	144	24	8	37	38	35	34
<i>C. m. schlegelii</i>	male	RMNH Cat. No. 12	Misool	84	90	184	133	22	8	37	39	36	37
<i>C. m. schlegelii</i>	male	RMNH.AVES.199509	Ternate	82	87	187	138	31	7	36	41	40	43
<i>C. m. schlegelii</i>	male	RMNH.AVES.199511	Ternate				139	28	8				
<i>C. m. schlegelii</i>	male	RMNH.AVES.199513	Ternate	82	87	185	135	30	8	38	42	38	39
<i>C. m. schlegelii</i>	male	RMNH.AVES.14996	Ceram	83	86	185	139		9	40	44	41	44
<i>C. m. schlegelii</i>	male	RMNH.AVES.199502	Ambon	81	84	183	136	24	9	45	51	47	49
<i>C. m. schlegelii</i>	male	RMNH.AVES.199503	Ambon			189	129	29	7	44	49	43	46
<i>C. m. schlegelii</i>	male	RMNH.AVES.199504	Buru				131			49	50	48	50
<i>C. m. schlegelii</i>	male	RMNH.AVES.199505	Seram			186	131		9	41	48	44	47
<i>C. m. schlegelii</i>	male	RMNH.AVES.199506	Buru	76		180	135	32	8	50	52	49	48
<i>C. m. schlegelii</i>	male	RMNH.AVES.199495	Seram	79	85	182	134	33	7	46	50	49	52
<i>C. m. schlegelii</i>	male	RMNH.AVES.199497	Buru			187	139	30	8	44	49	50	50
<i>C. m. schlegelii</i>	male	RMNH.AVES.199498	Seram	81	87	186	134	33	8	49	51	54	54
<i>C. m. schlegelii</i>	male	RMNH.AVES.199499	Ambon	76	80	187	142	32		43	49	45	47
<i>C. m. schlegelii</i>	male	RMNH Cat. No. 2	Saleyey	83	88	180	135	32	8	34	38	33	34
<i>C. m. macrurus</i>	male	RMNH.AVES.42713	Gng Koepak	81	85	185	136	28	9	36	41	40	40
<i>C. m. macrurus</i>	male	RMNH.AVES.42716	Gng Koepak	82	88	189	135	27	7	42	42	39	39

Taxon	Sex	Catalogue number	Location	Shortfall P2	Shortfall P1	Wing (flattened chord)	Tail	Bill length (from gape)	Bill length (from ant. point of nostril)	R5 white R outer web	R5 white R inner web	R4 white R outer web	R4 white R inner web
<i>C. m. macrurus</i>	male	RMNH.AVES.42717	Tjiodeng	74	80	180	130		7	40	41	38	38
<i>C. m. macrurus</i>	male	RMNH.AVES.42705	Struiswijk, Batavia	75	81	180	131	25	7	36	42	41	41
<i>C. m. macrurus</i>	male	RMNH.AVES.42727	gng massigit	76	79	176	128	27	7	38	43	39	40
<i>C. m. macrurus</i>	male	RMNH.AVES.42728	gng Massigit	79	84	185	130	28	8				
<i>C. m. macrurus</i>	male	RMNH.AVES.42719	Pangerango	77	81	178	133	30	8	37	41	36	36
<i>C. m. macrurus</i>	male	RMNH.AVES.42723	Gng Massigit	80	84	184	129	31	7	43	49	37	42
<i>C. m. macrurus</i>	male	RMNH.AVES.199488	Bolang						7				
<i>C. m. macrurus</i>	male	RMNH.AVES.199491	Gedangan	80	85	184	146		6	42	45	43	43
<i>C. m. macrurus</i>	male	RMNH.AVES.10104	Koeta, Bali	72	77	181	143	32	8	37	37	38	41
<i>C. m. macrurus</i>	male	RMNH.AVES.42724	Gng Massigit	77	81	178		29	7	40	45	42	42
<i>C. m. macrurus</i>	male	RMNH.AVES.25993	Bolang	76	80	180	143	29	7	41	42	39	38
<i>C. m. macrurus</i>	male	RMNH.AVES.26937	Cheribon			174	128		7				
<i>C. m. macrurus</i>	male	RMNH.AVES.28197	Cheribon							38	37	35	34
<i>C. m. macrurus</i>	male	RMNH.AVES.42698	Tjilandak	83	87	188	138	29	7	44	45	42	42
<i>C. m. macrurus</i>	male	RMNH.AVES.42701	Pasir Kananga	73	77	175	137	31	7	38	43	38	41
<i>C. m. macrurus</i>	male	RMNH.AVES.42702	Distr Palabuhan	73	77	175	129	28	8	39	45	44	45
<i>C. m. macrurus</i>	male	RMNH.AVES.42703	Bandjar	75	79	179	131	28	7	40	43	41	41
<i>C. m. macrurus</i>	male	RMNH.AVES.42704	Bandjar	78	82	180	143	26	8	36	41	39	39
<i>C. m. macrurus</i>	male	RMNH.AVES.82134	Kalidjati	82		180	132	24	7	40	45	39	42
<i>C. m. macrurus</i>	male	RMNH.AVES.82133	Og. Tjipatir	81	86	184	140	24	7	35	34	35	31
<i>C. m. macrurus</i>	male	RMNH.AVES.66828	Tjilangkat				143	24	7	43	42		
<i>C. m. macrurus</i>	male	RMNH.AVES.199490	Gedangan Semarang	75	80	179	141	30	7	41	44	41	43
<i>C. m. macrurus</i>	male	RMNH.AVES.42708	Bandjar	80	84	185	141	24	8	52	55	49	54
<i>C. m. macrurus</i>	male	RMNH.AVES.42709	Bandjar	75	82	183	142	26	8	41	47	44	45
<i>C. m. salvadorii</i>	male	RMNH.AVES.199464	Pontianak, Borneo	83	86	187	141	27	7	40	40	42	41
<i>C. m. salvadorii</i>	male	RMNH.AVES.199463	Pontianak, Borneo	78	84	182	137	31	8	45	44	41	44
<i>C. m. salvadorii</i>	male	RMNH.AVES.35808	Kuching, Borneo	79	85	185	130	27	7	46	45	43	46
<i>C. m. salvadorii</i>	male	RMNH.AVES.35810	Kuching, Borneo	80	85	182	136	25	7,5	40	43	38	41
<i>C. m. bimaculatus</i>	male	RMNH.AVES.199448	Malakka	90	95	202	140	32	7	41	48	43	42
<i>C. m. bimaculatus</i>	male	RMNH.AVES.199461	Salanga, Thailand	85	90	193	139	27	8	44	48	42	44
<i>C. m. bimaculatus</i>	male	RMNH.AVES.14995	Soengai Putih, Sumatra	85	90	188	145	32	7	41	30	43	43
<i>C. m. bimaculatus</i>	male	RMNH.AVES.14994	Soengai Putih, Sumatra				148	26	7				
<i>C. m. bimaculatus</i>	male	RMNH.AVES.199466	Medan	87	92	201	160	35	7	41	47	41	44

Taxon	Sex	Catalogue number	Location	Shortfall P2	Shortfall P1	Wing (flattened chord)	Tail	Bill length (from gape)	Bill length (from ant. point of nostril)	R5 white R outer web	R5 white R inner web	R4 white R outer web	R4 white R inner web
<i>C. m. bimaculatus</i>	male	RMNH.AVES.199465	Medan				144	29	6	52	53	48	47
<i>C. m. bimaculatus</i>	male	RMNH.AVES.199459	Sumatra	77	79	185	134	30	7	38	45	40	42
<i>C. andamanicus</i>	male	AMNH 632908	Bamboo Flat, Port Blair	82	86	184	125	32	7,3	32	36	32	33
<i>C. andamanicus</i>	male	AMNH 632909	Port Blair				124	31	6,4	31	35	32	33
<i>C. andamanicus</i>	male	AMNH 632910		76	81	180	124	33	6,5	28	33	31	33
<i>C. andamanicus</i>	male	AMNH 632912	South Brother Is.	84	88	186	122			33	36	33	35
<i>C. meesi</i>	male	RMNH.AVES.75297		75	80	178	133	20	8	42	43	40	40
<i>C. meesi</i>	male	AMNH 346702		69		165,5	126	21	8	37	43	37	40



**Table S10.** Raw morphometric data, females.

Taxon	Sex	Catalogue number	P9 emargination from tip	P8 emargination from tip	Shortfall P10	Shortfall P9	Shortfall P8	Shortfall P7	Shortfall P6	Shortfall P5	Shortfall P4	Shortfall P3
<i>C. ritae</i>	female	RMNH.AVES.162472	66	59			0	15	39	53	58	65
<i>C. ritae</i>	female	AMNH 632999	64	60	11	0	1	13	39	54	61	68
<i>C. m. schlegelii</i>	female	RMNH.AVES.42482	74	74	17	2	0	10		54	63	69
<i>C. m. schlegelii</i>	female	RMNH.AVES.199532	72	67	16	3	0	12	35	51	61	70
<i>C. m. schlegelii</i>	female	RMNH.AVES.199530	73	69	16	3	0	9	35	49	61	65
<i>C. m. schlegelii</i>	female	RMNH.AVES.42483	73	67	16	2	0	11	36	50	58	64
<i>C. m. schlegelii</i>	female	RMNH.AVES.185153	70	66	15	2	0	10	33	50	60	69
<i>C. m. schlegelii</i>	female	RMNH.AVES.42481	70	62				12	36	51	59	66
<i>C. m. schlegelii</i>	female	RMNH Cat. No. 14 (Misool)	72	66	15	3	0	10	34	50	59	68
<i>C. m. schlegelii</i>	female	RMNH.AVES.199516	77	68	15	0	0	8	34	53	65	72
<i>C. m. schlegelii</i>	female	RMNH Cat. No. 11 (Misool)	67	52								
<i>C. m. schlegelii</i>	female	RMNH.AVES.199507	78	70	13	2	0	8	34	52	62	68
<i>C. m. schlegelii</i>	female	RMNH.AVES.199496	73	68	16	1	0	12	36	54	65	
<i>C. m. schlegelii</i>	female	RMNH.AVES.199500	79	73	18	3	0	11	37	55	64	70
<i>C. m. schlegelii</i>	female	RMNH.AVES.199501	73	67	10	5	0	8	34	51	62	71
<i>C. m. macrurus</i>	female	RMNH.AVES.42700	74	70	14	4	0	12	38	52	62	68
<i>C. m. macrurus</i>	female	RMNH.AVES.42701	70	64	16	2	0	12	37		60	66
<i>C. m. macrurus</i>	female	RMNH.AVES.26938	68	65	8		0	12	40	53	61	67
<i>C. m. macrurus</i>	female	RMNH.AVES.42697	75	67	16	0	0	9	36	52	62	69
<i>C. m. macrurus</i>	female	RMNH.AVES.199482	70	67	13	3	0	10	38	53	62	69
<i>C. m. macrurus</i>	female	RMNH.AVES.42725	76	66	12	0	1	10	36	52	62	69
<i>C. m. macrurus</i>	female	RMNH.AVES.42726	75	67	14	2	0	12	37	54	64	72
<i>C. m. macrurus</i>	female	RMNH.AVES.42729	68	65	15	2	0	9	29			
<i>C. m. salvadorii</i>	female	RMNH.AVES.35809	77	70	13	3	0	11	39	52	64	72
<i>C. m. bimaculatus</i>	female	RMNH.AVES.199467	76	67	13	1	0	14	45	60	69	78
<i>C. m. bimaculatus</i>	female	RMNH.AVES.199469	76	70	19	3	0	11	37	54	64	73
<i>C. m. bimaculatus</i>	female	RMNH.AVES.199460										
<i>C. andamanicus</i>	female	AMNH 632911	72	67	13	0	2	14	38	52	61	69

**Table S10.** Raw morphometric data, females, cont.

Taxon	Sex	Catalogue number	Shortfall P2	Shortfall P1	Wing (flattened chord)	Tail	Bill length (from gape)	Bill length (from anterior point of nostril)	R5 outer webs Tail patch	R5 inner webs Tail patch	R4 outer webs Tail patch	R4 inner webs Tail patch
<i>C. ritae</i>	female	RMNH.AVES.162472	73		158	123	29	8	21	24	13	11
<i>C. ritae</i>	female	AMNH 632999	74	79	166	117		6	20	21	13	17
<i>C. m. schlegelii</i>	female	RMNH.AVES.42482	76	81	184	139	27	6	25	28	27	23
<i>C. m. schlegelii</i>	female	RMNH.AVES.199532	73	77	177	146	28	8	27	36	26	28
<i>C. m. schlegelii</i>	female	RMNH.AVES.199530	71	77	178	135	34	8	22	31	16	13
<i>C. m. schlegelii</i>	female	RMNH.AVES.42483	70	76	170	145	32	7	35	36	30	26
<i>C. m. schlegelii</i>	female	RMNH.AVES.185153	73	77	173	134		9	24	31	23	21
<i>C. m. schlegelii</i>	female	RMNH.AVES.42481	73	77	175	144	23	8	26	20	32	35
<i>C. m. schlegelii</i>	female	RMNH Cat. No. 14 (Misool)	77	82	179	133	27	6	23	23	17	13
<i>C. m. schlegelii</i>	female	RMNH.AVES.199516	77	83	185	142	31	8	20	19	12	7
<i>C. m. schlegelii</i>	female	RMNH Cat. No. 11 (Misool)			175	136	33	9	11	22		
<i>C. m. schlegelii</i>	female	RMNH.AVES.199507	73	77	181	136	32	8	30	29	31	27
<i>C. m. schlegelii</i>	female	RMNH.AVES.199496	80	83	178	138	34	8	28	26	27	25
<i>C. m. schlegelii</i>	female	RMNH.AVES.199500	76	79	186	148	31	8	28	31	27	27
<i>C. m. schlegelii</i>	female	RMNH.AVES.199501	75	81	180	148	35	8	24	27		
<i>C. m. macrurus</i>	female	RMNH.AVES.42700	73	77	181	143	29	7	24	27	23	23
<i>C. m. macrurus</i>	female	RMNH.AVES.42701	69	72	177	139	35	7	38	43	39	41
<i>C. m. macrurus</i>	female	RMNH.AVES.26938	73		169	136	30	6	23	23	18	15
<i>C. m. macrurus</i>	female	RMNH.AVES.42697	74	78	191	144	32	7	21	23	14	21
<i>C. m. macrurus</i>	female	RMNH.AVES.199482	74	80	181	146	26	6	21	21	14	14
<i>C. m. macrurus</i>	female	RMNH.AVES.42725	74	77	185	134	32	9	22	21	16	16
<i>C. m. macrurus</i>	female	RMNH.AVES.42726	78	82	182	139	31	8	17	17	9	9
<i>C. m. macrurus</i>	female	RMNH.AVES.42729			175	132	30	8	23	25	25	21
<i>C. m. salvadorii</i>	female	RMNH.AVES.35809		78	190	149	33	7	22	24	17	24
<i>C. m. bimaculatus</i>	female	RMNH.AVES.199467	84	87	190	142	30	7	20	23	10	8
<i>C. m. bimaculatus</i>	female	RMNH.AVES.199469	83	86	186	141	34	7	21	19	17	18
<i>C. m. bimaculatus</i>	female	RMNH.AVES.199460			167	134	33	7	10	11	8	8
<i>C. andamanicus</i>	female	AMNH 632911	76	78	178	121	32	7	12	13	12	13