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broad, but its form is very similar, and distinct from that of other grallatorial birds. It differs from *Thinochorus* (with which I at first thought it might be allied) in having two fissures in the posterior margin of the sternum, *Thinochorus* having but one. On comparing the skeleton with some portion of the skeleton of *Glareola pratincola*, the bones are almost identical in form, particularly the sternum, head and pelvis. I should therefore be inclined to place *Chionis* and *Glareola* in the same family.

Mr. G. R. Gray arranges this form along with the *Thinocorinæ* in his order '*Gallinæ*;' Prince Bonaparte, in his '*Conspectus Systematis Ornithologiæ*' (1854), places it next to the Gulls, in the order '*Gaviæ*.'

### 3. OBSERVATIONS ON THE GENUS CUSCUS, WITH THE DESCRIPTION OF A NEW SPECIES. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., PRES. ENT. SOC., ETC.

(Mammalia, Pl. LXI. LXII.)

Mr. Wallace having sent two specimens of this genus to the British Museum, to determine them I went over the previous observations on the genus, and examined the numerous specimens which are in the Museum collection, received from the French voyages of discovery, Mr. J. Macgillivray, the Naturalist of H.M. Ship '*Rattlesnake*,' and those now sent from the Island of Ula; and I have come to the belief that they are all to be referred to four species, which are very variable in the colour of the fur; one being variable in both the sexes, and the other, in which the sexes differ greatly from each other, but appear to be permanent in their colour; one species in which the furs of the two sexes are alike and uniform in colour; and one, of which the female sex only is known, which is uniform iron-grey.

The two have the ears small, hairy on both sides, and hidden in the fur; the other two have larger ears, exposed beyond the fur and bald within.

Herr Temminck, in the first volume of the '*Monographies de Mammologie*,' published in 1827, divides the short hairy-eared kinds into three species.

At the time he wrote he only had specimens from the northern part of Celebes, brought home by Professor Reinhardt, and from the islands of Banda and Amboyna.

The species evidently depend principally on the colour of the fur, which appears to be very variable in different individuals. It is true that he describes and figures skulls of the different individuals; but the difference between those of *Phalangista chrysorrhæos* and *P. maculata* appears chiefly to depend on the age and development of the specimen figured. M. Temminck and the writers of his school always forget that the skull and other parts of the skeleton are liable to quite as much variation from local circumstances, food,



and other accidental causes, as the colour of the fur or the size of the animal.

1. In *Phalangista ursina* the fur is thicker and closer, and the long hairs thicker than in the other species, blackish, with yellow tips to the longer hairs; and the forehead of the skull is flat. Of this he had several specimens of different ages, all brought by Professor Reinhardt from the northern part of Celebes, the natives of which have not observed any varieties in colouring.

2. *P. chrysorrhos* is described from two specimens brought home by the same Professor, from some of the Moluccas, which have a short cottony fur, of an ash-grey more or less black, and the rump and upper part of the base of the tail golden-yellow.

3. Of *P. maculata* Herr Temminck particularly observes, that the fur in all ages and in both sexes is covered with irregular white or brown spots, which are paler and less marked in the young. The very young are sometimes entirely ashy. They come from Banda and Amboyna.

The yellow colour of the rump and the base of the tail, as far as the specimens in the British Museum show, is common to the ashy specimens, which might be called *P. chrysorrhos*, and the variegated specimens, which might be named *P. maculata*: it is very difficult to distinguish the pale-rumped ashy ones from those without that mark; but it is easy to connect the grey or ashy spotted ones with either the one or the other; and it is impossible to separate the ashy-grey spotted ones from the brown or orange spotted specimens. In one specimen the animal is nearly white, with some small dark spots about an inch over; and in another the animal is white, with red feet, and one large red spot on the middle of the back.

From the examination of the specimens in the British Museum, and of their skulls, I am inclined to believe that the *P. ursina* is distinct, and that *P. chrysorrhos* and *P. maculata* are varieties of the same species.

#### 1. CUSCUS MACULATUS.

Ears almost hidden in the fur, clothed internally and externally with fur; forehead convex; forehead of the skull convex and rounded in front; grinders moderate; fur ashy-grey, or white and grey, or reddish, varied or spotted. Rump and base of the tail yellowish-white.

*Phalanger*, male, Buffon, H. N. xiii. t. 11.

*Phalangista maculata*, Desm. N. D. H. N. xxv. 472; Temm. Monog. i. 14. t. 3. f. 1-6; Quoy & Gaim. Voy. Uran. Zool. 59. t. 7; Waterh. Mamm. i. 274. f. .

*Phalangista ursina*, part., Waterh. Mamm. 267.

*Phalangista chrysorrhos*, Temm. Monog. i. 12; Waterh. Mamm. i. 271.

*Cuscus maculatus*, Lesson & Garnot, Voy. Coq. Zool. 150. t. 4.

*Cuscus macrourus*, Lesson & Garnot, Voy. Coq. Zool. i. 156. t. 5; Waterhouse, Mamm. i. 277.

*Hab.* New Guinea.



*Chrysorrhos* would perhaps be the better name for this species, because all I have seen have a yellow rump and base of the tail, but some are not spotted.

Of this species we have in the British Museum—

1. Adult female, from the Moluccas, from the Leyden Museum, sent as *C. chrysorrhos*. Uniform ashy-grey; face, throat, chest, and beneath the rump and base of the tail yellowish.

2. Young female, from the south coast of New Guinea. Presented by J. B. Jukes, Esq. Dark blackish-ashy; head, neck and shoulders paler; rump and base of the tail reddish-yellow; cheeks, throat and beneath white; feet bright red.

The two sides of this specimen are not coloured alike. The forehead of the *skull* is very convex.

3. Half-grown "male from Darnley Island, brought from the south coast of New Guinea." Presented by J. Macgillivray, Esq. Reddish; back and thighs darker blackish-ashy; cheeks, throat, under side, large confluent spots on the sides, the rump and tail white; feet bright red. Like *Cuscus maculatus*, Quoy and Gaimard, Voy. Uranie, t. 7.

4. Half-grown "male from New Guinea." Presented by J. Macgillivray, Esq. Like the former, but white, with irregular large symmetrical pale reddish spots on body, limbs and tail.

5. Half-grown "female from Dufaure Island, south coast of New Guinea." Presented by John Macgillivray, Esq. Like the former, but white, with one very large reddish spot on the hinder part of the back; two large spots on the hind legs, and an obscured indication of a large patch on the shoulders; the feet red.

6. Half-grown, from the "island of Waygeroo." From M. Verreaux. Ashy-grey cheeks; back with some white spots; throat, chest, belly, rump and tail white; sides white, with scattered, round, nearly equal-sized spots; feet reddish.

7. Adult male. Aru Island. Sent by Mr. Wallace. White; body and limbs with small, roundish, rarely confluent, black-ashy spots; feet white: the skull has a very convex forehead.

*Cuscus maculatus*, Lesson, Voy. Coq. t. 4, is intermediate in colour and marking between Nos. 7 and 3.

*Cuscus macrourus*, Lesson, Voy. Coq. t. 5, from the island of Waygeroo, bears a great similarity to No. 3; but the reddish spots are less confluent.

The figure of *C. Quoyi*, in Quoy and Gaimard, Voy. Uranie, t. 6, looks like a specimen of this species intermediate between the ashy and spotted variety, being ashy with darker obscure spots.

## 2. CUSCUS BREVICAUDATUS.

The ears hid in the fur, woolly internally and externally; tail short; the forehead —?; the front lower cutting-teeth broad.



Female uniform ashy-grey ; rump and base of tail, throat, chest and belly yellowish dirty-white.

*Phalangista nudicaudata*, Gould, Proc. Zool. Soc. 1849, 110.

*Hab.* Cape York.

This species is only known for "a female two-thirds grown, sent from Cape York" to the British Museum by John Macgillivray, Esq.

It is very like the ashy variety of *C. maculatus*, but the front lower cutting-teeth are much broader, and the tail, which has the bones still remaining on it, is considerably shorter than any of our specimens of *C. maculatus*.

The specimen in the British Museum is that described by Mr. Gould.

Mr. Gould refers this animal to the subgenus *Pseudocheirus* of the genus *Phalangista*, and calls it *P. nudicaudata*, because it "differs from all the other Australian members of the genus in having the apical three-fourths of its tail entirely destitute of hair." But Mr. Gould overlooked the fact that it is not a *Pseudocheirus*, but a *Cuscus*, all the species of which have the major part of the tail naked ; and the species under consideration has the naked part of the tail, and indeed the tail itself, shorter than the rest of the species ; so that the specific name of *nudicaudata* is singularly inapplicable.

The light mark on the rump, which Mr. Gould compared to that of the *Koala*, is also common to the species of *Cuscus*, and is probably produced by the habit of the animal sitting on its rump, rolled up into a ball, on the fork of the branches of trees.

The skull shows that the animal is much younger than the label indicates, as it appears only to have the milk teeth, and the broad lower incisors of the younger specimens of this genus. The skull differs both from that of *C. ursinus* and *C. maculatus*, but it is too young to predict what may be the normal form of the adult animal.

The front half of the space between the eyes is rather convex, but not nearly so much so as the young skull of *C. maculatus* ; and the front of the forehead just behind the convexity described is rather concave ; this concavity has no resemblance to the deep concavity occupying nearly the whole space between the eyes in *C. ursinus* and *C. maculatus*.

### 3. CUSCUS URSINUS.

Ears almost hidden in the fur, clothed with fur internally and externally ; fur blackish-ash, with larger silvery hairs ; head, throat, belly and tail rather pale brown ; forehead flat, concave ; forehead of the skull flat, deeply concave ; grinders large, in a strongly-arched series.

*Phalangista (Ceonix) ursina*, Temm. Monog. i. 10. t. 1. f. 1-3 ; t. 2. f. 1-5, skull ; t. 3, skeleton ; Lesson, Cent. Zool. t. 10 ; Waterhouse, Mamm. i. 267, part.

*Hab.* Celebes.

We have in the British Museum only a single specimen of this species with its skull, which was obtained from the Zoological Society,



and is the specimen described by Mr. Waterhouse in Mammalia, i. p. 268. The other specimen there indicated as being in the British Museum is a young *C. maculatus*.

In Lesson's figure in Cent. Zool. t. 10, it is represented as uniform blackish-brown, with rather large white-edged ears!

The larger size of the teeth and the flatness of the forehead at once separate this from *C. maculatus*.

### 3. CUSCUS ORIENTALIS (Pl. LXI.).

Ears produced beyond the fur, naked internally; forehead concave. Male white. Female pale reddish-brown, with a darker longitudinal streak; skull with a narrow concave forehead; grinders moderate.

- ♀ ♂ *Phalangista cavifrons*, Temm. Monog. i. 17.
- ♀ ♂ *Cuscus orientalis*, Gray, List Mam. B.M. 84.
- ♀ ♂ *Phalangista (Cuscus) orientalis*, Waterh. Mamm. i. 279.
- ♂ *Coescos*, Valentyn, Omst. in Amboyna, iii. 272.
- Phalanger*, Penn. Quad. ii. 27.
- ♂ *Didelphis orientalis*, Pallas, Misc. Zool. 59; Schreb. Saugth. iii. 550. t. 152.
- ♂ *Cuscus Amboinensis*, Lacép.
- ♂ *Phalangista alba*, Geoff. Cat. Mus.
- ♂ *Cuscus albus*, Lesson & Garnot, Voy. Coq. Zool. i. 158. t. 6.
- ♂ *Balantia orientalis*, Illiger, Prod. 78.
- ♀ *Phalangista rufa*, Geoff. Cat. Mus.; Desm. N. D. H. N. xxv. 473.
- ♀ *Phalanger*, female, Buffon, H. N. xiii. t. 10.
- Cuscus Quoyii*, Lesson, Mam. 226.
- Phalangista Quoy*, Quoy & Gaim. Voy. Uranie, Zool. 58. t. 6??
- Phalangista Quoy*, Temm. Mon. Mamm. i. 17.
- Phalangista Papuensis*, Desm. Mam. Supp. ii. 541; Bull. Sci. Nat. iii. 64.
- Phalangista (Cuscus) maculata*, part., Waterhouse, Mam. i. 275.
- ? *Cuscus albus*, Lesson, Voy. Coq. t. 6, ♂?

Of this species we have in the British Museum—

1. Adult male, from New Ireland, procured from M. Verreaux of Paris; said to have come from one of the expeditions. Pure white; throat yellow; feet nearly bald.

2. A nearly adult male, from the old collection, said to have come from Amboyna. White.

3. Young male? Uniform pale brownish-yellow; throat, chest and belly whiter. From island of Waygeroo; procured from M. Verreaux of Paris.

4. Adult female: ashy-brown, glistened with silvery; throat, chest and belly pure white; back with a narrow uniform longitudinal streak. This is sent as *Cuscus Quoyii*, Lesson, Mam. 220; *Ph. Papuensis* of Desmarest, Supp. The figure of M. Gaimard's animal



in the 'Voyage of the Uranie,' t. 6, is more like a variety of *C. ursinus*; but the description agrees with our animal.

5. Young female, from the island of Waygeroo; procured from M. Verreaux.

6. Young female, from Aru Islands; procured from Mr. A. R. Wallace. These two only differ from the adult specimen in the silvery hairs of the back being rather more abundant, but they seem to be deciduous.

*Phalangista Papuensis* of Desm. was described from a female specimen collected by M. Gaimard, which was afterwards described as *Ph. Quoyi*. In Quoy and Gaimard, 'Zoology to the Voyage of the Uranie,' it is described as having a darker dorsal line, which rather widens over the loins, which at once shows that it must be the female of *P. orientalis*.

Mr. Waterhouse has referred both these names without any comment as a synonym of *P. maculata*, misled probably by Herr Temminck, who (Mon. Mamm. i. 18) states it to be a young *P. maculata*—evidently overlooking the dorsal stripe.

Lesson, in the 'Voyage of the Coquille,' figures a male animal as *Cuscus albus*, t. 6, from Port Praslin, New Ireland, which is white, with a narrow black streak, just as in the female of this species.

Knowing the little authority that is often to be placed on M. Lesson's figures, I suspect it is the figure of a pale or perhaps bleached specimen of a female *P. orientalis*, in which some fold of the pouch, probably produced from bad stuffing, has been mistaken by the artist for the scrotum of a male.

#### 4. CUSCUS CELEBENSIS (Pl. LXII.).

Ears produced beyond the fur, naked internally. Male and female alike, ashy-grey, grizzled with silvery hairs; the nape and the upper part of the middle of the back blacker, but without any distinct dorsal streak.

*Cuscus Celebensis*, Brit. Mus.

*Hab.* Celebes.

We have of the species—

1. Young animal, from the island of Macassar; procured from Mr. J. R. Wallace in 1851.

2. Adult male and female, from San Cristoval, Soloman Group of Islands, Dec. 1855. Presented by John Macgillivray, Esq. and F. M. Rayner, Esq. in 1856.









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Wolf, lith

M & N. Hanhart Imp<sup>t</sup>

CUSCUS CELEBENSIS, ♂ & ♀ Gray.