

## Synchronised Displaying of three Adult Male Wilson's Birds-of-paradise *Cicinnurus respublica* on Batanta Island, West Papua, and an Undescribed Display Posture

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**Summary:** Wilson's Bird-of-paradise *Cicinnurus respublica* is endemic to two islands of the Raja Ampat island group off the western tip of the Bird's Head peninsula of the island of New Guinea. Due to its remote home, it is little known, and its courtship behaviour in the wild was not described until the 1990s. To attract females for mating, males create and maintain a clearing, known as a court, on the forest floor, where they display on perches. These displays are normally performed by solitary males, but in this paper we describe an instance of three adult males displaying simultaneously, with highly synchronised movements, in the presence of three female-plumaged birds. This cooperative display incorporated at least five postures, one of which has not been described to date, involving the bird 'bowing' to accentuate its yellow hind neck patch. Whilst cooperative displays have not been observed in the closest relatives of this species, the Magnificent and King Birds-of-paradise, they appear to occur regularly in the four species of parotias *Parotia spp.*, albeit for much shorter periods of time.

**Ringkasan:** Burung Cendrawasih Botak adalah jenis yang endemik di dua pulau di Raja Ampat, ujung barat dari Papua Barat. Untuk menarik betina, jantan membuat dan mempertahankan suatu lokasi pada lantai hutan yang disebut sebagai tempat perkawinan dimana jantan bisa mempertunjukkan daya tariknya sambil bertengger dekat tanah. Pertunjukan daya tarik ini umumnya diperlihatkan oleh individu jantan yang soliter, tapi dalam artikel ini kami menjelaskan suatu keadaan dimana tiga individu jantan dewasa mempertunjukkan daya tariknya secara bergantian dengan gerakan sangat serasi dimana tiga individu betina juga hadir. Pertunjukan daya tarik secara bersama-sama ini memperlihatkan setidaknya lima gerakan dimana satu gerakan belum pernah dijelaskan sebelumnya, yaitu gerakan 'membungkuk' untuk lebih memperlihatkan bagian belakang kepalanya yang kuning. Sementara gaya pertunjukan daya tarik secara bersama-sama ini belum pernah teramati pada kerabat terdekat dari jenis ini yaitu Cendrawasih Belah-rotan dan Cendrawasih Raja, namun nampaknya fenomena ini terjadi secara teratur dalam empat jenis *parotias*, meskipun untuk periode waktu yang lebih singkat.

### Introduction

Despite its iconic status among the birds-of-paradise, famous for their ornate plumage and spectacular courtship displays, the Wilson's Bird-of-paradise *Cicinnurus respublica* is still one of the most poorly known of the family. Its annual cycle and basic breeding biology, such as nest and eggs, remain unknown. Confined to the islands of Waigeo and Batanta in the Raja Ampat island group off the west

coast of the Bird's Head Peninsula, West Papua, Indonesia, the species is best known for the striking blue bald patch across its crown and nape, overlain with fine black 'cross-hair' feather markings. Whilst the display court and some display postures of the male had been described from captive birds as early as the 1920s, the former was not described from the wild until 1955, and the full courtship behaviour of the species was unknown until it was filmed by the BBC in the 1990s. The following account of the display is largely based on the description by Frith & Beehler (1998) of the sequence of events captured on film by Attenborough (1996) and others, and the accompanying illustrations of males' postures in Figure 9.62 of their account.

Initially a male, perched at the base of vertical sapling, responds to the arrival of a female-plumaged bird with a "frozen" posture ((a) in Figure 9.62 of Frith & Beehler 1998). Soon the female perches above him, at which time he directs his head and bill at her with all of his plumage sleeked, but his neck and tail held normally ((b) in aforementioned figure). During this phase, he sharply flicks his head and neck a very short distance to either side with an 'odd clockwork-like motion', while producing a softly-whistled "whisper" song of ticking and buzz-like sounds. As the female approaches him he suddenly pulls his head and neck back into his body and quickly elevates his iridescent emerald green and purple breast-shield so that its flattened surface is at a right angle to the bill-head axis, and cocks his tail up by c. 90° (c). After this display the female invariably flies to a nearby sapling, and the male again sleeks himself and stretches his neck, head and bill towards her with his tail still cocked, but with the breast-plate position modified (Frith & Beehler 1998). In illustration (d), which shows this posture, the breast-plate is held at a shallower angle from the body than in (c), and the upper margin appears to be extended anteriorly. Captive males in British zoos performed the same display sequence, except that the bill was occasionally gaped during postures (c) and (d), and a *back display* was also observed in which a bird stooped to a position parallel with the perch, then depressed its head and moved it slowly from side to side whilst perched 'broadside to the observer', before suddenly turning and resuming the abovementioned postures (Winterbottom 1928; Frith 1974).

At one court on Batanta Island a court-owning adult male and a female-plumaged immature male, less than 1.0 m apart, simultaneously performed the pointing posture towards a presumed female, quickly swinging their bodies from one side to the other so as to keep pointing at the female as she moved from perch to perch around the court (T. Schulze-Westrum film *in litt.*, in Frith & Beehler 1998). Their movements were so synchronised that they resembled "two compass needles, remaining stiffly parallel to each other". In film footage subsequently taken by Zebra Films in 1998 an adult male can be seen displaying to a presumed female on a vertical perch above the court while two immature males attempted to simultaneously display to her, the adult male ignoring them. One or more immature male(s) were also seen to clean the court floor of this adult male (C.B. Frith, *in litt.*).

## Our observations

During a birdwatching trip to Batanta ( $0^{\circ} 53.95' S$ ,  $130^{\circ} 39.95' E$ ), we made observations of Wilson's Bird-of-paradise at 'Kamp Kris' (named after Kris Tindige; see Noske 2009) on the morning of 28 August 2011. The day was overcast but not raining. Before dawn our group of ten, including all of the authors, climbed the mountainside to a hide overlooking a court of this species that was known to be in use since 2009 (S. Prativi, unpubl. data). As we approached the hide, which was c. 5 m from the court, we heard the call of the male(s). At 06:50 hrs, shortly after we had settled in and around the hide, two males and a presumed female flew towards the court and perched in the tree(s) above the hide. Within 5 min the males had descended to the ground and had begun displaying mostly while perched on the lianas and/or aerial roots that formed a tangle just above the ground. Initially, these two males displayed to the one female-plumaged bird but after c. 10 min a second female-plumaged bird arrived at the court. A third male arrived after a further 3-5 min, and after perhaps another 3-5 min a third female-plumaged bird arrived. The total number of birds at the court was now six.

During the next 30 min of displaying, all of the birds left the court for two brief periods of 3-5 min, and then for a longer period of c. 10 min. Following this longer period they all returned to the court to display, or be displayed at, for a further c. 15 min, after which they all disappeared and were not seen on the court again. Between their displays the males hopped up vertical lianas or aerial roots to c. 2 m before returning to the lower horizontal ones. The female-plumaged birds watched from perches c. 50 cm higher, with the exception of one, which may have been immature male as its plumage appeared somewhat different to the others and the adult males paid no attention to it. This bird did, however, seem interested in proceedings.

Typically, the three males would fly towards the ground, remaining 10 to 30 cm apart, and display simultaneously for up to 2 min at a time. The males' performance became more intense as their display progressed, with movements becoming more synchronised and coordinated. We observed all four (a-d) postures that are illustrated in Frith & Beehler (1998), but not the 'back display' that was observed in British zoos (Winterbottom 1928; Frith 1974). Plate 1 shows a male adopting the 'frozen' posture (a) on a near-vertical aerial root. Plate 2 shows a similar posture except that the head and neck have been slightly lowered, giving a more stooped appearance, perhaps because the bird is on a horizontal, rather than vertical, perch and the female-plumaged bird is not directly above him. As the male appears still or 'frozen' for several seconds during most of these postures we prefer to use the term 'hunched' for posture (a). In Plate 3 the leftmost of the three males is in this hunched posture, while the middle bird has the breast-plate expanded and tail wires cocked as in the final 'extended stare' posture (d), except that the neck is not stretched and body is not obviously sleeked. Plates 4 and 5 show males simultaneously adopting the latter posture, with the body more or less sleeked, which we prefer to call the 'epaulette' display based on the appearance of the upper part of the expanded breast-plate from behind. These photos also confirm the impression of the observers that for much of the time the males directed their attention towards one, rather than two or three, of the spectating birds. During most of the displays the three males suddenly and synchronously changed the direction of their bill-pointing many times,

these being dictated by the changing positions of the presumed female(s), just as described in the above account of two males displaying at one court in Schulze-Westrum film.

On several occasions we saw the males adopt a ‘bowing’ posture that was unlike any described by Frith & Beehler (1998). On at least two such occasions two males bowed together, but at other times, bowing was performed independently. In this posture, the head and neck were lowered so that bill pointed towards the ground, and the rear of the body, including the tail, was also lowered below horizontal, so that the back, including its expanded or flattened red mantle with a black fringe, appeared arched (Plate 6). The blue scalp and yellow patch behind it were displayed to the spectating bird, and were accentuated against the black background of surrounding feathers. Although the yellow patch has been described as a ‘discrete semicircular nape cape of brilliant yellow’ (Frith & Beehler 1998), our photographs clearly demonstrate that the yellow feathers form a strip along the hind-neck, rather than the nape, and that the shape of this patch is elongate-oval or rectangular, as shown in drawings (b-d). Plate 7 shows a male in a similar posture, except that the rear of the body and tail were raised above horizontal. Whether this pose constitutes yet another new posture or simply a variant of the ‘bowing’ posture is unknown.

Other behaviours seen by one or more of the observers involved the bill. On at least one occasion, the bills of the male and a female-plumaged bird almost touched, the tips of the bills appearing to vibrate, and in one instance, a male held what appeared to be a seed (Plate 8), which was later presented to a female. The bright greenish-yellow mouth of the male was displayed towards the female on several occasions, sometimes accompanied by harsh vocalisations. However, at no time did we observe any behaviour similar to the ‘dancing’ display of the Magnificent Bird-of-paradise *C. magnificus*, that Frith & Beehler (1998) speculated might occur in Wilson’s Bird-of-paradise after the full display posture (c).

On many occasions during their displays, the tail-wires of the males appeared to be silvery-white in colour, amply illustrated in Plates 1, 3 and 8, reminiscent of the yellow cape of the Magnificent Bird-of-paradise, which is described as having an “intense iridescence of white light, giving a spun glass appearance’ (Frith & Beehler 1998). The central tail sickles of the Wilson’s Bird are in fact, iridescent violet-purple, like those of the Magnificent Bird, and while those of the latter species are also cocked at right angles to the back, presumably to present the upper surface to the female, there has been no mention of them appearing white (Coates 1990; Frith & Beehler 1998).

Following the last display we observed, no birds were seen or heard for another 15 min, after which one male was heard calling from the mid-storey at intervals of several minutes, though he did not return to the court. We left soon afterward. Two days later (30 August) one of our group returned to the hide in an attempt to capture the display on video, but during c. 2h of watching, only one male visited the court, spending much of its time clearing away leaves from the court, and no females visited.



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**Plate 1.** Adult male Wilson's Bird-of-paradise in 'frozen' or hunched display posture at court on Batanta Island, 28 August 2011.



CHRIS BARNES

**Plate 2.** Male on horizontal plank root, in hunched posture similar to that in Plate 1, except with head and neck slightly lowered.



CHRIS BARNES

**Plate 3.** Three adult males simultaneously displaying to a partly visible female-plumaged conspecific, with third male (far right) mostly obscured. Note that the leftmost male is in hunched posture, while middle bird is in 'epaulette' posture, but the neck is not stretched or the body sleeked.



CHRIS BARNES

**Plate 4.** Two males simultaneously performing the 'epaulette' display to a female-plumaged bird.





CHRIS BARNES

**Plate 5.** Three males simultaneously performing the ‘epaulette’ display to a female plumaged bird, the rear half of which can be seen on a branch c. 40-50 cm above them.



CHRIS BARNES

**Plate 6.** A male adopting the ‘bowing’ posture, accentuating the yellow hind-neck patch.



CHRIS BARNES

**Plate 7.** Male in 'bowing' posture similar to that in Plate 6, except that rear of body and tail are raised.



CHRIS BARNES

**Plate 8.** Male with seed in his bill, possibly before presenting it to a female-plumaged bird.



## Discussion

The Wilson's Bird-of-paradise is one of six species birds-of-paradise (including the Magnificent Bird-of-paradise and four *Parotia* spp), in which males create a terrestrial court by removing foliage from the bases of several vertical sapling stems that are used as perches during the display, and clearing litter from the forest floor beneath them to expose the bare ground, which provides a plain backdrop that accentuates his colourful plumage (Frith & Beehler 1998). These species, and the majority of birds-of-paradise, have a solitary, non-territorial display strategy, in which males are uniformly dispersed through the forest, and is in contrast to the lek system of, for example, *Paradisaea* species in which as many as 40 males cluster in one or more trees to attract females. Males of solitary species rarely perform communal displays, although rival males and young males commonly visit courts when the owner is absent (Frith & Beehler 1998).

The widely-distributed and much better-studied Magnificent Bird-of-paradise is the closest relative of the Wilson's Bird-of-paradise, and many aspects of their displays and plumage are similar. Rand (1940) saw an aggressive interaction between an adult court-owning male and a visiting immature male, and suggested that young males probably visit courts in the absence of their owners in order to display, and perhaps to mate if the opportunity presents itself. Beehler & Pruett-Jones (1983) also stated that males will visit, and occasionally display at courts of their neighbours during the owner's absence. Thair & Thair (1977) observed two 'fully-plumaged' adult male Magnificent Birds-of-paradise at a court in the Western Highlands Province of Papua New Guinea. Between 08:00 and 09:00 hrs the first male arrived and started displaying, and occasionally calling, on a horizontal branch c. 60 cm above the ground. After about 30 min the second male arrived, and a few minutes later, four females appeared. During the observation period no agonistic behaviour was observed. Although only one male appeared to be displaying at any given time, it was unclear if the displayer was always the same individual, due to frequent 'flitting about' and changes of positions. Unfortunately, shortly after the displaying male began his cape display something disturbed the birds and they all flew away (Thair & Thair 1977). Thus, whilst it is uncertain whether the court owner was the first or second male to arrive, he clearly tolerated the presence of the other male, even while displaying, possibly to avoid scaring away a potential mating partner.

The closely related King Bird-of-paradise *C. regius* has an 'exploded lek' mating system intermediate between a solitary court and a true lek, in which typically two or occasionally up to four males are loosely clustered, with their respective display trees c. 45-90 m apart, yet they are not known to display simultaneously in the same display tree. Whilst an adult male may tolerate another briefly in or around his display tree without overt aggression, he will follow the visitor closely and may adopt a threat posture indicative of his mood, and "fighting males have been known to fall to the ground locked in combat" (Frith & Beehler 1998).

The more distantly related Lawes' Parotia *Parotia lawesii* also has an exploded-lek mating strategy, and as in the Wilson's Bird-of-paradise, males display on a terrestrial court that they keep meticulously clean by removing all fallen leaves and other debris (Frith & Beehler 1998). Each court is owned and maintained by a single

adult male, and courts of neighbouring males, whilst averaging 77 m apart, can be as close as 5 m (Beehler & Pruett-Jones 1983). Males with courts less than 15 m apart were in visual contact in some cases, and often disrupted each other's courtship displays, or occasionally, engaged in cooperative displays, in which up to five neighbouring males would display with the court-owning male for short periods (1-10 min) until they were chased away by the latter at the climax of the performance (Coates 1990). Such cases occurred in about 10% of the courts in the population, and only when there was a large group of females visiting the court (S.G. Pruett-Jones, *in litt.* to Coates 1990). In the case of Carola's Parotia *P. carolae*, a single court may also occasionally be attended by several adult males simultaneously (Healey 1980). One particular case involved sub-adult males and up to two adult males, with all birds joining in calling, until the presumed adult male court-owner evicted the other birds (B. Beehler in Coates 1990). Similarly, Western Parotia *P. sefilata* adult males often tolerate 3-4 other sub-adult males on perches above their court, but not on the court floor, and when approached by the court-owner, these males quickly vacate their perches (Frith & Beehler 1998).

Therefore, it seems that neither of the congeners of Wilson's Bird-of-paradise is known to display cooperatively, though in the case of Magnificent Bird-of-paradise a second male may be tolerated occasionally on the court while the (presumed) owner displays. However, cooperative displays by adult males are known to occur among the parotias until the court owner, at some point, evicts the other males. Significantly, in the case of Lawes' Parotia, the cooperative displays occurred only when a large group of females was present, and lasted for up to 10 min before the owner demonstrated his dominance. Our observations of Wilson's Birds on the court lasted 45-60 min in all, and there was no indication that any of the three males was dominant over the others. Only three female-plumaged birds were present at this court, and if the presence of many females was an important pre-requisite for the formation of cooperative displays, then one might expect it to occur at more than 10% of courts.

From consideration of the above observations, two scenarios seem plausible to explain the cooperative display we witnessed: the absence of the court-owning male or the presence of more females than is typical. The court we watched was not known by locals before 2009, but was discovered after a previously-used court less than 100 m away had been abandoned by its owner (S. Prativi, pers. obs). On at least eight occasions from 2009 to 2011, the current court was attended by a single male who performed alone to presumed females. Whether the cooperative display we witnessed was occasioned by the temporary absence of the owner is unknown, but the court was occupied by only one male two days later. Although only one female was evidently present in the two accounts of displays of Wilson's Birds-of-paradise in the wild, described by Frith & Beehler (1998), one of us (SP) regularly saw two or three female-plumaged birds at courts during at least 15 visits to the site. Given the staggered arrival of birds of both sexes during our observations, it is possible that the third male and female-plumaged bird were attracted to the court by the increasing number of birds, but this does not adequately explain why the first two males initially co-displayed when only one female-plumaged bird was present, or why all of the males seemed to direct their attention solely to this female-plumaged

individual for much of the time. Thus, neither of the postulated scenarios adequately explains our observations.

Whilst synchronized cooperative courtship displays appear to be rare among birds-of-paradise, they are normal for some neotropical manakins, in which teams of males display cooperatively. Yet only the alpha partner mates with visiting females, while the subordinate, beta partner may spend as many as 4 to 10 years in the supporting role, waiting for the opportunity to move up in rank. Evidence for the Long-tailed Manakin *Chiroxiphia linearis* suggests that non-mating males benefit from increasing their competence at performing the complex duet song and joint dance, and may eventually enjoy increased mating success when they inherit display sites from older males (Trainer *et al.* 2002). Whether such benefits might also accrue for non-mating males of Wilson's Bird-of-paradise can only be revealed through intensive studies. Nevertheless, based on the literature and ten years' experience of one of the authors (SP), the cooperative display we describe above must be considered rare. It is puzzling that the bowing display posture has not previously been described. We note that this display presents the yellow hind-neck patch to the females in much the same way as the Magnificent Bird-of-paradise presents his yellow cape (see Coates 1990).

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