

Bowerbird display site nomenclature: The court case for the Tooth-billed Bowerbird

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Abstract

The male Tooth-billed Bowerbird clears a display court on the ground. Some authors have erroneously referred to this court as a bower. This is incorrect and confusing from the English language, scientific, and ornithological literature points of view. The reasons for this misuse of the word bower are explained and discussed, and another example of how such inappropriate nomenclature have persisted in the bowerbird literature is detailed. The recent standard and widely used nomenclature for bowerbird display sites is provided. In addition, the males of Tooth-billed and one or two other bowerbirds have been described as forming exploded leks at their display sites, but this has never been unequivocally demonstrated, for reasons detailed and discussed.

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Handling editor: Don Franklin

Citation: Frith CB. 2016. Bowerbird display site nomenclature: The court case for the Tooth-billed Bowerbird. *North Queensland Naturalist* 46: 107-114.

The Tooth-billed Bowerbird (*Scenopoeetes dentirostris*) is an endemic monotypic Australian genus confined to the Wet Tropics of north Queensland. It was long thought to be most closely related to the monogamous catbirds, bowerbirds of the genus *Ailuroedus* of New Guinea and Australia in which males do not clear a court or build a bower for courtship but do assist in nest building and provisioning of offspring. All other bowerbird species are polygamous, in which their promiscuous males clear a court (only the Tooth-billed) or build a bower and do not attend the nest (Frith & Frith 2004, 2009). The erroneous perception of the close relationship between the catbirds (Fig. 1) and the Tooth-bill (Fig. 2) was due to them all having similar adult plumage; with streaked underparts, in both adult sexes. This is quite unlike most other bowerbirds, in which adult males have bright colourful plumage parts, while adult females and immatures of both sexes are similarly dull.

We now know that the Tooth-bill is genetically a typical bowerbird (Kusmierski *et al.* 1993, 1997). It is most closely related to the gardener bowerbirds



Figure 1. An adult Black-eared (Spotted) Catbird *Ailuroedus melanotis*, Topaz, north Queensland, Australia. All photographs are by Clifford B. Frith.



Figure 2. An adult male Tooth-billed Bowerbird *Scenopoeetes dentirostris* advertisement calling, Paluma, north Queensland, Australia.

(genus *Amblyornis*, endemic to New Guinea; but according to one or two recent taxonomists possibly including the Golden Bowerbird of the monotypic genus *Prionodura* endemic to Australia) that all build large bowers of the maypole type (Fig. 3). Despite being a typical bowerbird, the Tooth-bill is distinctly atypical of them in that males do not build any kind of bower: males but merely clear a display site on the ground. The display site is a roughly oval or circular area of several square metres of rainforest floor, with leaf litter being meticulously cleared by the bird throwing material off the area with its beak to expose the soil. This cleared court, conspicuously contrasting with the surrounding leaf litter, is then decorated with large freshly plucked leaves laid paler underside uppermost upon it. The male sings above his leaf strewn court to attract females; the singing presumably also deters rival males (Fig. 4).



Figure 3. The simplistic maypole bower of a Macgregor's Bowerbird *Amblyornis macgregoriae*, Tari Gap, Papua New Guinea.



Figure 4. An adult male Tooth-billed Bowerbird *Scenopoeetes dentirostris* calling above his leaf-decorated court, Paluma, north Queensland, Australia.

The Tooth-bill was long called Stagemaker or Stage-maker, which was inappropriate because in clearing a court males produce nothing remotely stage-like — i.e. a raised platform, as the word stage is defined by dictionaries. *Scenopoeetes* means stage or nest maker (cf. Jobling 2010). It is, however, disruptive to an established and logically applied nomenclature for avian courts and bowers that a few people have inexplicably referred to the court of the Tooth-billed Bowerbird as a bower without discussion or justification (e.g. Lucas & Le Souëf 1911; Warham 1962; Everett 1978; Morcombe 2000).

It is most important that incorrect usage, such as referring to the court of a Tooth-billed Bowerbird as a bower, be corrected in the literature because failure to do so can result in long term use of erroneous and confusing nomenclature by copycat authors. An example of this within the bowerbirds was the relatively recent use of the inappropriate

common name of Spotted Catbird for what is more accurately known as the Black-eared Catbird *Ailuroedus melanotis*. Black-eared was applied to this catbird when it was originally described (Gray 1858: 181) and long persisted until recently changed without comment. The literal translation of its scientific specific name *melanotis* is "black-eared" (Jobling 2010). Dawn Frith and I therefore reverted to the correct Black-eared Catbird (Frith & Frith 2004: 235), as had several other recent authors, and also because this species is no more spotted than the other catbird species save on its crown (but Spotted-crowned or Spotted-capped Catbird have never been applied to the species). Black-eared Catbird is thus historically correct and descriptively informative, and also more helpful given that there is the White-eared Catbird *A. buccoides* in New Guinea. Moreover, the Spotted Bowerbird *Chlamydera maculata* represents a potentially confusing name within the family (see Frith & Frith 2004 for further discussion). Black-eared Catbird was recently applied and acknowledged as the officially correct name for this bowerbird (Frith & Frith 2008, 2009; Beehler & Pratt 2016; Gill & Donsker 2016).

The bower

The word bower was apparently first applied to the structures of vegetation *built* to rise above the ground by male bowerbirds, as a three-dimensional edifice, by the English ornithologist John Gould. While visiting Australia, Gould sought out and studied bowers of Satin and Spotted Bowerbirds in New South Wales. He first used the word bower on 25 August 1840, when he wrote "These *constructions* are perfectly anomalous in the *architecture* [italic emphasis mine] of birds, and consist in a collection of pieces of stick and grass, formed into a bower; or one of them (that of the *Chlamydera*) might be called an avenue, being about three feet in length and seven or eight inches broad inside...." (Fig. 5). He also noted that the bowers are "used by the males to attract females" (Gould 1841: 94). From this I suspect that, in using the word bower, Gould had in mind the arched garden structure, or frame, forming a 'bower' or 'arbour' (often with a bench seat within) common in formal English gardens of his time. It is probably no coincidence, given Gould's immediate appreciation of the courting function of bowers,



Figure 5. An adult male (in foreground) Great Bowerbird *Chlamydera nuchalis* courting a visitor to his avenue bower, Townsville, north Queensland, Australia.

that such garden 'bowers' often specifically served as places for a couple of people of the opposite sex to meet and become acquainted during their formal courtship. My Collins English Dictionary first defines this kind of bower as: "a shady leafy shelter or recess, as in a wood or garden; arbour."

Bower has been the appropriate and scientifically valid word most often applied to the structures *constructed* by males of all of the bower building species throughout the literature since Gould's first use of it, notwithstanding other inappropriate anthropomorphic words such as run or playing-house (which Gould also used), playhouse, playground, play place, circus ring, stage, stage-ground, cleared space, clearing, etc. Thus in the English language, ornithological, and bowerbird contexts, the word bower has a specific meaning in applying to three-dimensional structures (but not the items brought to them as bower decorations) built above ground by male bowerbirds. It has also been applied to the grass courting 'structures' (not constructed by the birds, but rather a slightly modified grass tussock) of male Jackson's Widowbirds of Africa (Andersson 1991), although not strictly appropriate. Admittedly, confusion has been caused by some authors using the word court for bower structures or parts of them. For example, in clearing an area prior to accumulating a bower 'mat' of moss or ferns on that clearing the maypole builders (including Archbold's Bowerbird) are thus said to clear a court. In addition, the area immediately around a bower structure (which includes the stick 'platforms' upon which decorations are mostly located) that is *cleared* by the male bower owner might be called a court (Frith & Frith 2004). The word bower has also been applied to the court of the Tooth-bill, as detailed above.

Several authors applied the word bower to the courting and egg-laying and egg-fertilising areas of sand scraped together by male mouth-brooding cichlid fishes. This was, however, shown to be inappropriate and misleading as (1) the fish scrapes are not a bower as defined in the ornithological literature (i.e. for courtship and mating only), (2) bowerbirds use separate nests for egg-laying, and (3) the fishes scrapes are used for both display and egg-laying (Tweddle *et al.* 1998).

The court

In describing the first Tooth-bill specimen ever collected, E. P. Ramsay (1876) wrote of the species "not yet known to *build a bower*; [italic emphasis mine] but like the Catbirds it clears a large space under the brushwood some 9 or 10 feet in diameter...."; it then being erroneously thought that catbirds cleared a court. Thus in the first ever text about the Tooth-bill the distinct difference between a constructed bower and a cleared court was made. Quite remarkably, in writing of the Tooth-bill in 1891-8 Richard Bowdler Sharpe stated that its court clearing characteristic "places ... [it] among the 'Gardener' Bower-birds...." (see second paragraph of this contribution). Alan J. (Jock) Marshall, the great pioneering student of living bowerbirds, predominantly described the Tooth-bill's court as its "display ground", if once erroneously and confusingly writing that it "builds its curious leaf-strewn 'stage' ", while at another point specifying that no edifice is involved (Marshall 1954).

I have not attempted to determine when the word court was first applied to the cleared display ground of the Tooth-bill: the important point being, however, that recent standard, major, works reviewing the bowerbirds use the word court or display area for the area of ground cleared by male Tooth-bills (Gilliard 1969; Johnsgard 1994; Donaghey 1996; Lenz 1999; Frith & Frith 2004, 2008, 2009; Higgins *et al.* 2006; Erritzoe *et al.* 2007; Ottaviani 2014).

To lek or not to lek

Unfortunately, the word arena has also been applied to the court of a single male Tooth-bill (e.g. Chaffer 1984; Forshaw & Cooper 1977). Arena refers not to an area used by a single male but, rather, to an area used by an aggregation of males as a common courtship ground (Campbell & Lack 1985; Johnsgard 1994; Erritzoe *et al.* 2007). Arena is thus synonymous with lek, which is more often used in ornithology than is arena.

Several recent authors have suggested that male Tooth-bills at their courts form or may form leks, albeit exploded ones (i.e. the males at their adjacent courts are not in visual contact, as in true leks, but are in auditory contact when calling). It must be stressed, however, that lekking of any kind has yet to be convincingly demonstrated in Tooth-

bills, or in any other bowerbird species. To definitively do this it must be shown that the apparent clumping of courts does indeed represent discrete leks within uniform habitat that is suitable throughout for courts or bowers of the species concerned. This is because the clumping of courts or bowers could in fact reflect that the macro or micro topography elsewhere is unsuitable (i. e. that the habitat is not uniform), even if in a subtle way. Thus the observed clumping of courts would therefore reflect where suitable micro habitat for courts exist, rather than reflecting any lekking behaviour by males.

Numerous forest structural traits may result in a mosaic of subtly slightly differing micro habitats, some areas of which are of lesser or no attraction to male Tooth-bills for court sites. For example, too dense an understory of vegetation would be useless (i.e. too dense sapling trunks or foliage), as might too sparse an understory. Males might require a particular percentage of canopy cover, and thus ambient light regime, at potential court sites; we simply do not know. The lack of suitable display trees, or their presence at too great or too sparse a density, for courts to be cleared around, would be another serious micro habitat negative. Tooth-bills require the base of a sapling or tree trunk (53 averaging 114 mm diameter at my breast height in my Paluma study area; Frith & Frith 1994) pre-existing within what becomes their cleared court area. Males use this tree base to hide behind as they call to attract and impress females. Critical studies are required that test the proposition that male Tooth-bills courts, or bowers of any other bowerbird species, form leks as opposed to their distributions being dictated by the environment.

Court versus bower

It was once put to me that the Tooth-bill's court has the same function as a bower and therefore why should it not be called a bower. This is not only irrelevant to the matter of English and scientific application to the nomenclature of bowerbird display sites, but it is also an oversimplification. As the great student of bowerbirds A. J. Marshall wrote (1954: 164) "Although the display ground of the Stagemaker has some of the functions of the bowers of the true bower-birds it is utterly different, both in architecture and decoration, from either of the two larger groups of bower-birds." However, both the

Tooth-bill's court and bowers do function in providing an initial visual clue to females of a male's courting site location, a courting site with a facility for the male to hide behind (if not built in the case of the Tooth-bill), and some measure of the owner's ability to clear a court or build a bower. Bower structures, however, do far more than provide a constructed and sophisticated screen that can be interposed between the sexes during courtship: their size, quality, and symmetry of structure; quantity, placement, and quality of their decorations; extent, quality, and freshness of bower painting (applied by the male to the walls of their bowers) and additional characteristics provide females with multiple and inter-related information about a male's physical investment and artistic abilities in creating and decorating his bower and his genetic fitness as well (Borgia 1986; Frith & Frith 2004).

Male Tooth-bills frequently produce loud, complex, and sophisticated vocalisations at their courts that females can assess and compare in choosing a mate. Thus, the vocalisations of male Tooth-bills could be seen as compensating for their lack of a constructed bower. While the relative mating success of males in some bowerbird species has been correlated to individual differences in their bower quality and decoration types and numbers, we have little data supporting understanding of what influences choice of mates by female Tooth-billed Bowerbirds.

To call the court of the Tooth-bill a bower is erroneous and confusing. Males of a number of other birds, world wide, clear a display area on the ground for courtship just like the Tooth-bill does. Males of several bird of paradise species not only do this, but they also collect and bring items to their courts to decorate them with; I am, however, unaware of any ornithologist suggesting that they be called bowers because they are perceived to have the same function as the bowers of bowerbirds — or for any other reason. In the ornithological context the word court was recently defined as "1) a small patch of ground often cleared of litter and debris and defended by a single male on a communal display ground. 2) the cleared terrestrial area of a male bowerbird" (Erritzoe *et al.* 2007). Thus the cleared area used by each male Guianan Cock-of-the-rock on their communal display area, or lek, is correctly called a court (Kirwan & Green 2012) as are the cleared

display areas of individual male birds of paradise (Frith & Beehler 1998, Laman & Scholes 2012; Pratt & Beehler 2015).

The nomenclature for bower types that is presently widely accepted and used by most ornithologists, and certainly by the vast majority of recent and contemporary bowerbird students, was recently reviewed and defined as follows: Catbirds clear **no court** and build **no bower**; Tooth-bills clear and decorate a **court**; the gardener, Golden and Archbold's bowerbirds build a **maypole bower** (albeit, the bower of the latter is a rather more dispersed structure); and all remaining species (silky, satin, and grey bowerbirds) build an **avenue bower** (Frith & Frith 2004, 2008, 2009; Higgins *et al.* 2006). Bowers are simplistic to highly complex three-dimensional *constructions or accumulations* of material above ground, while courts are mere ground *clearings* involving no building or edifice. I rest my court case.

Acknowledgements

It is my pleasure to express my thanks to Natalie Doerr, Don Franklin and Peter Valentine for constructive thoughtful comment resulting in improvements to this contribution.

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