

Iguanidae T. Bell 1825 [O. Torres-Carvajal, K. de Queiroz and J. A. Schulte II], converted clade name

Registration Number: 52

Definition: The largest crown clade containing *Iguana* (*Lacerta*) *iguana* (Linnaeus 1758) (*Iguanidae*), but not *Agama* (*Lacerta*) *agama* (Linnaeus 1758) (*Agamidae*) and *Chamaeleo* (*Lacerta*) *chamaeleon* (Linnaeus 1758) (*Chamaeleonidae*). This is a maximum-crown-clade definition. Abbreviated definition: max crown ∇ (*Iguana iguana* (Linnaeus 1758) ~ *Agama agama* (Linnaeus 1758) & *Chamaeleo chamaeleon* (Linnaeus 1758)).

Etymology: Derived from *Iguana*, the name of one of its subclades, which is based on the Spanish “Iguana”, which is in turn derived from the Carib “iwana” (Burghardt and Rand, 1982).

Reference Phylogeny: Figure 6 of Estes et al. (1988). For details concerning the composition and internal relationships see Etheridge and de Queiroz (1988), Frost and Etheridge (1989), Schulte et al. (2003), and Townsend et al. (2011), although some of those authors use the name *Iguanidae* for a smaller clade and call the clade in question *Pleurodonta* (see Comments).

Composition: *Iguanidae* contains approximately 1200 currently recognized extant species (Uetz, 2020) within 12 mutually exclusive clades (Schulte et al., 2003): *Anolis*, *Corytophaninae*, *Crotaphytinae*, *Hoplocercinae*, *Iguaninae*, *Leiocephalus*, *Leiosaurini*, *Liolaemini*, *Oplurinae*, *Phrynosomatinae*, *Polychrus*, *Tropidurini* (some authors [e.g., Townsend et al., 2011] use names that all end in *-idae* for the same clades). A compilation of fossil *Iguanidae* can be found in Estes (1982), with subsequent additions in

Alifanov (2000), Evans (2003), Conrad and Norell (2007), Conrad (2008, 2015), Longrich et al. (2012), and Smith and Gauthier (2013).

Diagnostic Apomorphies: Unambiguous morphological synapomorphies of *Iguanidae* have not been reported (Estes et al., 1988; Etheridge and de Queiroz, 1988; Frost and Etheridge, 1989; Gauthier et al., 2012); lists of characters that change along the relevant branches are provided by DeMar et al. (2017).

Synonyms: *Iguanoïdes* Blainville (1816, 1822), *Iguanae* (Spix, 1825), *Pachyglossae coelodontae* (Wagler, 1828), *Pachyglossae platycormae pleurodontes* + *Pachyglossae stenocormae pleurodontes* (Wagler, 1830), *Iguanina* Bonaparte (1831, 1840, 1841), *Dendrobatae Prospodyodontes* + *Humivagae Prospodyodontes* (Wiegmann, 1834), *Iguaniens Pleurodontes* + *Eunotes Pleurodontes* (Duméril and Bibron, 1834–1854; Duméril and Duméril, 1851), *Pleurodontes* + *Prospodyodontes* (Fitzinger, 1843), *Iguanoidea* + *Agamida Pleurodonta* (Stannius, 1856), *Iguania* (Cope, 1864, 1875, 1889), *Iguanida* Strauch (1887), and *Pleurodonta* (Frost et al., 2001) are all approximate synonyms.

Comments: Early authors used diverse characters to divide iguanian lizards (often excluding the highly modified chamaeleons) into two primary subgroups. Those characters included compressed versus depressed body form (e.g., Wagler, 1830; Bonaparte, 1841), toothed versus toothless palate (e.g., Gray, 1825; Cuvier, 1829; Bonaparte, 1831), tree climbing versus ground walking habits (e.g., Wiegmann, 1834; Fitzinger, 1843; Gravenhorst, 1843), and

pleurodont versus “acrodont” tooth implantation (e.g., Wagler, 1828; Duméril and Bibron, 1834–1854; Bonaparte, 1831; Gray, 1845; see Estes et al. 1988 concerning tooth implantation in supposedly acrodont iguanians). The division based on tooth implantation ultimately prevailed, with the names *Iguanidae* (for the pleurodont forms) and *Agamidae* (for the “acrodont” forms) being widely adopted from the late 1800s to the late 1900s (e.g., Boulenger, 1885; Cope, 1900; Fürbringer, 1900; Gadow, 1901; Camp, 1923; Williston, 1925; Romer, 1933, 1945, 1956, 1966; McDowell and Bogert, 1954; Underwood, 1971; Estes, 1982; Estes et al., 1988). By the late 1900s, authors realized that pleurodonta is an ancestral character state and that morphological evidence for the monophyly of *Iguanidae* was lacking (e.g., Etheridge and de Queiroz, 1988; Estes et al., 1988), which led to a proposal to abandon the taxon as previously circumscribed (Frost and Etheridge, 1989). Nonetheless, subsequent phylogenetic analyses of DNA sequences have found strong support for the monophyly of the *Iguanidae* as traditionally circumscribed (e.g., Macey et al., 1997; Schulte et al., 1998, 2003; Harris et al., 2001; Townsend et al., 2011; Pyron et al., 2013).

Of the names previously applied to the clade in question (see Synonyms), most have been rarely used after the nineteenth century, and some of them are compound names and therefore unsuitable for conversion (*ICPN*, Art. 17.1; Cantino and de Queiroz, 2020). Only two names have been applied to the clade during the last 100 years, *Iguanidae* and *Pleurodonta*. Of these two names, the former has been used widely since the early 1900s, while the latter has been used for the clade in question only since Frost et al. (2001). Concomitant with this historical difference, *Iguanidae* has been used far more commonly for a taxon approximating the clade for which we are establishing it, including

effective application to the crown. Moreover, the name *Pleurodonta* has at least three undesirable properties. First, it describes an ancestral character state that is widely distributed outside of the clade in question. Second, when used in the nineteenth century, the name was applied either to a much less inclusive group (e.g., Stannius, 1856) or, in keeping with the ancestral status and widespread distribution of pleurodonta, to a much more inclusive one (e.g., Cope, 1864, 1875). Third, it is a homonym of *Pleurodonta* Beck 1837, a name, applied to a taxon of mollusks, that is not currently in use but is nevertheless available under the *ICZN* (*International Commission on Zoological Nomenclature*, 1999) and therefore could be converted under the *ICPN*. For all of these reasons, the name *Iguanidae* is the more appropriate name for the clade under consideration.

Related to the alternative names for the clade in question, as well as to disagreements about rank assignment under the *ICZN*, the name *Iguanidae* has been applied to two different clades in the recent literature. Thus, when Frost and Etheridge (1989; see also Frost et al., 2001) rejected the traditional *Iguanidae* because of its then-questionable monophyly, they restricted that name, and its associated rank of family, to one of eight subgroups recognized by themselves and previous authors (e.g., Etheridge and de Queiroz, 1988). By contrast, other authors have preferred to apply the name *Iguanidae* to the group with which it was traditionally associated, at first with an explicit acknowledgment of its uncertain status (e.g., Estes et al., 1988; see also Zug, 1993; Schwenk, 1994), and later under subsequently discovered support for its monophyly (e.g., Macey et al., 1997; Harris et al., 2001; Schulte et al., 2003; Gauthier et al., 2012). This traditional use became established in the nineteenth century (e.g., Gray, 1827, 1845; Boulenger, 1884, 1885), was almost universal for most of the twentieth century (e.g., Cope, 1900;

Gadow, 1901; Camp, 1923; Williston, 1925; Romer, 1933, 1945, 1956, 1966; McDowell and Bogert, 1954; Underwood, 1971; Estes et al., 1988; Etheridge and de Queiroz, 1988), and continues to be accepted by many authors (e.g., Macey et al., 1997; Harris et al., 2001; Schulte et al., 2003; Gauthier et al., 2012; Smith and Gauthier, 2013), including those of influential general works (e.g., Zug et al., 2001; Pianka and Vitt, 2003; Pough et al., 2004). This long-established use justifies applying the name to the more inclusive clade. Moreover, the smaller clade has been given a different name, *Iguaninae* Cope 1886, which is one of the earliest names to have been given an explicit phylogenetic definition (de Queiroz, 1987).

Under the *ICPN*, Thomas Bell is considered the author of *Iguanidae* because he was the first author to use that name (Bell, 1825). Under the *ICZN*, Oppel (1811) is considered the author of *Iguanidae* because his *Iguanoidea* seems to have been the first name based on the name *Iguana* proposed at the rank of family.

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Date Accepted: 10 April 2014; updated 6 November 2017

Primary Editor: Philip Cantino