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CYTOGENETIC DATA ON SPECIES OF THE FAMILY HYLIDAE (AMPHIBIA, ANURA): RESULTS AND PERSPECTIVES

REVISÃO DOS DADOS CITOGENÉTICOS EM ESPÉCIES DA FAMÍLIA HYLIDAE (AMPHIBIA, ANURA): RESULTADOS E PERSPECTIVAS

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ABSTRACT

The family Hylidae is the most species-rich anuran family, including more than 890 species. Recently, this family went through extensive taxonomic and systematic revisions based mostly on molecular data, with almost no contribution of cytogenetic information. Relatively few species have been karyotyped, mainly with the use of differential staining techniques, therefore here is a void of chromosome data in the context of the new phylogenetic hypotheses proposed. In this paper, we present a literature review of chromosomal studies in hylid species. This compilation provides information for the research on relationships and chromosome evolution in the family.

Keywords: Chromosome. Karyotype. Hylinae. Pelodryadinae. Phyllomedusinae

RESUMO

A família Hylidae é a mais abundante entre os anuros, compreendendo mais de 890 espécies, as quais mostram uma ampla distribuição geográfica. Recentemente, essa família passou por extensas revisões de taxonomia e sistemática, com base principalmente em dados moleculares, com rara contribuição de informações citogenéticas. Poucas espécies foram cariotipadas até a presente data, principalmente com uso de técnicas de coloração diferencial e, por essa razão, os dados cromossômicos considerando a nova hipótese filogenética são bastante fragmentados. Neste artigo, portanto, apresentamos uma revisão da literatura disponível acerca das pesquisas envolvendo a análise cromossômica em hilídeos. Essa compilação traz informações relevantes para estudos voltados às relações filogenéticas e evolução cromossômica na família.

Palavras-chave: Citogenética. Cariótipo. Hylinae. Pelodryadinae. Phyllomedusinae.

Introduction

Hylidae is currently the most specious rich of the Anuran families, being widely distributed in North and South America, the Australian/Papuan region and temperate Eurasia, including the extreme northern Africa and the Japanese Archipelago (Frost, 2009). Although some groups of hylids have been reviewed (e.g. CHEK et al., 2001; FAIVOVICH, 2002), a comprehensive phylogenetic analysis of the family, with special emphasis in the subfamily Hylinae, was presented only after the extensive studies carried out by Faivovich et al. (2005). Based mainly on the phylogenetic analysis of DNA sequence data of mitochondrial and nuclear genes, a new taxonomy has been established. According to it, the subfamilies of Hylidae were reduced to Hylinae, Pelodryadinae and Phyllomedusinae, and several other modifications were introduced. These were fully confirmed soon after by Frost et al. (2006) in a systematic review of the whole class Amphibia, also based on molecular data, and by Wiens et al. (2006, supp. data).

One of the relevant modifications in the new taxonomy concern the genus *Hyla*, the most speciose of Hylidae with more than 350 species. Faivovich et al. (2005) restricted the genus to only 56 species, those of the former species groups *H. arborea*, *H. cinerea*, *H. eximia*, *H. femoralis*, and *H. versicolor*. The remaining species were reallocated in 17 genera, of which *Aplastodiscus*, *Plectrohyla*, *Ptychohyla*, and *Scinax*, were already recognized; four, *Dendropsophus*, *Exerodonta*, *Hyloscirtus*, and *Hypsiboas*, were resurrected genera; and nine, *Bokermannohyla*, *Bromeliohyla*, *Charadrahyla*, *Ecnomiohyla*, *Isthmohyla*, *Itapotihyla*, *Megastomatohyla*, *Myersiohyla*, and *Tlalocohyla*, were new generic names.

According to Frost (2009) the subfamily Hylinae comprises 636 species distributed in the tribes Cophomantini (*Aplastodiscus*, *Bokermannohyla*, *Hyloscirtus*, *Hypsiboas*, and *Myersiohyla*), Dendropsophini (*Dendropsophus*, *Pseudis*, *Scarthyla*, *Scinax*, *Sphaenorhynchus*, and *Xenohyla*), Hylini (*Acris*, *Anotheca*, *Bromeliohyla*, *Charadrahyla*, *Diaglena*, *Duellmanohyla*, *Ecnomiohyla*, *Exerodonta*, *Hyla*, *Isthmohyla*, *Megastomatohyla*, *Plectrohyla*, *Pseudacris*, *Ptychohyla*, *Smilisca*, *Tlalocohyla*, and *Triprion*), and Lophiohylini (*Aparasphenodon*, *Argenteohyla*, *Corythomanthis*, *Itapotihyla*, *Nyctimantis*, *Osteocephalus*, *Osteopilus*, *Phyllodytes*, *Tepuihyla*, and *Trachycephalus*).

Pelodryadinae includes species previously allocated in the genera *Cyclorana*, *Litoria*, and *Nyctimystes*, but currently all assigned to *Litoria* (FROST et al., 2006), in order to avoid its paraphyly. At present, this genus is the most abundant in the family Hylidae comprising 188 species (FROST 2009).

Phyllomedusinae is the sister-group of Pelodryadinae and these two subfamilies form the sister-taxon of Hylinae (FAIVOVICH et al., 2005). Phyllomedusinae includes the genera *Agalychnis*, *Cruziohyla*, *Hylomantis*, *Pachymedusa*, *Phasmahyla*, *Phrynomedusa*, and *Phyllomedusa*. *Cruziohyla* is a generic name created by Faivovich et al. (2005) to include two species formerly allocated to *Agalychnis*, whereas all the other genera were already recognized before 2005. Another modification refers to the assignment of six species, previously considered in *Phyllomedusa*, to the genus *Hylomantis*.

Hylidae includes 891 known species (FROST, 2009), but the number of karyotyped species is relatively scarce. The two most complete reports on the diploid numbers of hylids are King (1990), Kuramoto (1990) and a partial update performed by Green and Sessions (2007). In this paper, we present a review of chromosome numbers described, up to date, for Hylidae species which are listed in table 1 according to the current taxonomy of the family (FROST, 2009). We expect this paper may help those interested in cytogenetics, taxonomy, and systematics of hylid frogs.

Methods and techniques on anuran cytogenetic: development and perspectives

Methods applied for chromosome research in anuran have changed considerably through the

years. The first cytogenetic studies in anuran were carried out in the 1930s, through the analyses of meiotic cells. Since 1959, it was possible to analyze mitotic metaphases using colchicine combined with the hypotonic treatment of the cells. Although chromosome studies were restricted to standard staining, relevant information concerning number, size and chromosomal morphology, were of great relevance to cytogenetic progress.

Since 1970, differential staining techniques developed for human cytogenetics (VERMA; BABU, 1995), have also been used successfully in other vertebrates including amphibians. The heterocromatin identification through C-banding and the labeling of Nucleolus Organizing Region by impregnation with silver nitrate, Ag-NOR, became two basic tools of karyotype characterization in anurans (SCHMID et al., 1990). Currently, amphibian chromosomes have been analyzed with more fine-grained techniques, such as the incorporation of 5-bromodeoxyuridine (BrdU) in DNA, allowing the differentiation of the replication bands on the chromosomes. In this way chromosome pairs can be unequivocally identified. Relevant information on amphibian chromosomes were also obtained with restriction endonuclease banding or after base-specific fluorochrome staining (SCHMID et al., 1990; ANDERSON, 1991; KASAHARA et al., 2003; GRUBER et al., 2007).

Molecular cytogenetic techniques are starting to be routinely employed in Amphibians. Fluorescent *in situ* Hybridization (FISH) with an important diversity of probes, including ribosomal and telomeric sequences, provides detailed analysis of the anuran chromosomes. Variants of this procedure (GUERRA, 2004) have been successfully developed and undoubtedly, cross-species chromosome painting (ZOO-FISH) is the most promising technique for comparative cytogenetic analyses (PIECZARKA; NAGAMACHI, 2004). However, this procedure has not yet been extensively used in anurans (GREEN; SESSIONS, 2007).

All these techniques are valuable to detect chromosome variation related to autosomal heteromorphisms due to structural rearrangements, occurrence of natural polyploidy, presence of B chromosomes or even cytologically differentiated sex chromosomes. Their use allows a better understanding of mechanisms involved in chromosome evolution, and consequently the resolution of taxonomic and systematic questions, once comparative analysis are performed. Comparative cytogenetic analysis may be particularly useful in the cases of cryptic species or species complex, in the identification of new species or natural hybrids (HADDAD et al., 1994) and consequently to the conservation projects.

Cytogenetic data on the family Hylidae

A remarkable characteristic of the subfamily Hylinae is the karyotype with 24 chromosomes. It occurs in the majority of the species, although 2n greater or lower than 24 have also been found, including a case of polyploidy in *H. versicolor* with 2n=4x=48. Most of them share not only the same diploid number, but also very uniform chromosome morphology, predominantly metacentric and submetacentric, so that the fundamental number of chromosome arms (NF) is in general 48 of total. Even when banded chromosomes with BrdU labeling were compared among some 2n=24 species, belonging or not to the same genera, a high level of correspondence in their replication banding patterns was observed (KASAHARA et al., 2003; GRUBER et al., 2007).

In the tribe Cophomantini a karyotype with 2n=24 is commonly found; however some variability in the diploid number is observed. This fact is particularly evident among the species of *Aplastodiscus*: two of them exhibited 2n=24, three, 2n=22, one, 2n=20 and one, 2n=18 (BOGART, 1973; CARVALHO et al., 2009a; CARVALHO et al., 2009b). In the two other genera of Cophomantini analyzed so far, *Bokermannohyla* and *Hypsiboas*, some discrepant karyotypes were reported. In *H. albopunctatus*, specimens showed 2n=22 or 2n=23 this latter bearing one supernumerary or B chromosome (GRUBER et al., 2007). *Bokermannohyla luctuosa* presents 2n=25, with one B in a basic karyotype with 2n=24 (BALDISSERA JR et al., 1993). No cytogenetic data are available for

the two other genera of Cophomantini, *Hyloscirtus* and *Myersiohyla*.

Almost all species within the tribe Hylini, belonging to the genera *Anotheca*, *Charadrahyla*, *Duellmanohyla*, *Exerodonta*, *Hyla*, *Isthmohyla*, *Plectrohyla*, *Pseudacris*, *Ptycohyla*, *Smilisca*, *Tlalocohyla*, and *Triprion*, have a 2n=24 karyotype. A diploid number of 2n=22 occurs in the three species of the genus *Acris*, *A. crepitans*, *A. blanchardi* and *A. gryllus;* the former also presenting an intraspecific variability due to one to five B chromosomes (NUR; NEVO, 1969). From this tribe, karyotype data is not available for species in the genera *Bromeliohyla*, *Ecnomiohyla*, and *Megastomatohyla*.

Within the tribe Lophiohylini, species with diploid numbers greater than 2n=24 were reported sporadically. In fact, the 2n=24 karyotypes are characteristic of most species included in *Aparasphenodon*, *Argenteohyla*, *Corythomanthis, Itapotihyla*, *Osteocephalus*, *Trachycephalus*, and *Osteopilus* with the exception of *Osteopilus wilderi* with 2n=28 and *Osteopilus brunneus* with 2n=34. Currently, no published cytogenetic data are available for the genera *Nyctimantis*, *Phyllodytes*, and *Tepuihyla*.

The majority of the species within the tribe Dendropsophini, belonging to the genera *Pseudis*, *Scinax*, and *Sphaenorhynchus*, show 2n=24 karyotypes. Nevertheless, 2n=28 was described in the species *Pseudis cardosoi*, and a karyotype variant with 2n=24+1B was reported in *Scinax fuscovarius* (RABELLO, 1970). No cytogenetic information is available for *Scarthyla* and *Xenohyla*.

The most remarkable finding in Dendropsophini is the occurrence of 2n=30 in all species of *Dendropsophus* karyotyped so far. Some of them exhibit B chromosomes, like *D. berthalutzae* with 2n=30+2B (FORESTI, 1972) and *D. nanus* with 2n=30+1B (MEDEIROS et al., 2006). Although the chromosomes of *Dendropsophus* are mostly metacentric or submetacentric, a certain number of telocentrics or subtelocentrics occur in most species. The number of uniarmed chromosome pairs is highly variable, from one to five, and completely absent in some karyotypes, so that NF=60, 54, 52, and 50 occur. Karyotype variability within *Dendropsophus* is even greater, considering that in species with the same number of uniarmed chromosomes, these are not always homeologous pairs (GRUBER et al., 2005). *Dendropsophus ruschii* presented an heteromorphic pair only in male karyotypes, so that sex chromosome determination of XX:XY type was suggested by Nunes (2006).

Within the subfamily Pelodryadinae, most species exhibits 2n=26 chromosomes, with exception of *Litoria genimaculata* and *L. infrafrenata*, both with 2n=24, but 2n=30 was also described for *L. angiana* (DUELLMAN, 1967). Karyotypes with 2n=26 are also characteristic for species of the subfamily Phyllomedusinae, although one of them, *Phyllomedusa tetraploidea* with 2n=4x=52 (BEÇAK et al., 1970; BARRIO, 1976; BATISTIC, 1989) has a polyploid origin. It is interesting to remark that 2n=40 was described by Nunes and Fagundes (2008b), in one specimen of *P. rohdei*, a very discrepant diploid number within the genus. Although not proved, these authors suggested its origin from an ancestral karyotype with 2n=26 that went through centric fissions followed by pericentric inversions. In this species and in *Phasmahyla exilis*, Nunes and Fagundes (2008b) also reported a heteromorphic chromosome pair, which was interpreted as XY sex chromosomes. Considering that a single male specimen was available, a larger sample of both males and females of the two species should be analyzed with use of techniques other than conventional staining, and especially meiotic phases in testis chromosomes preparations. There is no cytogenetic data for the genus *Phrynomedusa*.

In all Hylidae, heteromorphic sex chromosomes, either ZZ:ZW, like in *Hyla squirella* and *Pseudis tocantins*, or XX:XY type, like in *Hyla femoralis*, *H. japonica*, and *H. savignyi* were described (YOSIDA, 1957; ANDERSON, 1991; SCHMID; STEINLEIN, 2003; WILEY, 2003; AL-SHERI; AL-SALECH, 2005; BUSIN et al., 2008). Nevertheless, in these two latter cases, the presence of differentiated sex-chromosomes was not confirmed in further analyses.

The data presented in the Table 1 were obtained from original published papers, Master, Doctoral and PhD dissertations and the revisions of King (1990) or Kuramoto (1990). The species

are separated according to the subfamilies Hylinae, Pelodryadinae, and Phyllomedusinae, as well as to tribes and species groups to which they are assigned. Some particular information, like the occurrence of supernumerary B chromosomes, morphologically differentiated sex chromosomes, and if analyses with differential staining were carried out, was also indicated. Both the original species name used by the authors and the current one are listed.

Concluding Remarks

About 35% of all known hylid species have been karyotyped. The great majority of the studies were based on conventionally stained mitotic or only meiotic chromosomes. The karyological information was sometimes restricted to the diploid numbers, and the chromosome morphology is not mentioned. The number of karyotyped species in the family Hylidae with differential staining techniques is increasingly great, and they concern mainly the Ag-NOR and C-banding. Nevertheless, other procedures, such as AT and GC-specific fluorochrome staining, FISH with rDNA and telomeric probes, banding with restriction enzymes, and replication banding using BrdU incorporation have been used, but less intensively (SCHMID, 1978; WILEY, 1982; 2003; KING, 1990; KING et al., 1990; ANDERSON, 1991; WILEY et al., 1992; MIURA, 1995; SCHMID et al., 1995; KAISER et al., 1996; WILEY; LITTLE, 2000; BUSIN et al., 2001; KASAHARA, et al., 2003; MEDEIROS et al., 2003; SCHMID; STEINLEIN, 2003; ANANIAS et al., 2004; GRUBER et al., 2007; BUSIN et al., 2006; MEDEIROS et al., 2006; NUNES, 2006; NUNES; FAGUNDES, 2008a; BUSIN et al., 2008; CARVALHO et al., 2009a,b).

Within the subfamilies Hylinae and Phyllomedusinae, cytogenetic data are completely lacking for some genera, but this is not the case of Pelodryadinae, which currently includes only the genus *Litoria*. Although gaps exist with regard to some hylid genera, relevant conclusions can be taken on the basis of the known diploid numbers. The most outstanding characteristic of the family Hylidae is the karyotype bearing 2n=24, which is shared by the majority of the species within the subfamily Hylinae. According to Faivovich et al. (2005), 2n=24 might be a synapomorphy of the subfamily Hylinae but the corroboration of this hypothesis requires information on chromosome morphology of most basal genera of the tribes Cophomantini and Lophiohylini, *Myersiohyla* and *Phyllodytes*, respectively. No cytogenetic data is still available for these genera, and our preliminary observations in *Phyllodytes luteolus* have shown 2n=22 (CATROLI, GF., personal observation).

The analyses performed by Faivovich et al. (2005) and Wiens et al. (2006, supp. data) shows that Pelodryadinae and Phyllomedusinae are closely related, and this relationship is fully confirmed by the cytogenetic data. They share the apparently plesiomorphic 2n=26 diploid number, but they also have very similar karyotypes.

It is clear that chromosome information on hylid genera that had never been karyotyped, is still necessary to increase the understanding of chromosome evolution within the family. Also, considering that in some genera of Hylidae karyotypes are very similar, it is evident that the application of differential staining techniques is necessary to improve the comparative cytogenetic analyses and to elucidate the mechanisms involved in chromosome evolution in the family and its relevance to phylogenetic studies.

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Table 1 - Chromosome numbers in species of the family Hylidae.
a Name according to Frost, 2009; 2n Diploid number; B Supernumerary chromosome

(continue)

Species[a]	Name used in the report	2n	Differential staining	Reference
Subfamily Hylinae				
Tribe Cophomantini				
Genus *Aplastodiscus*				
***A. albofrenatus* group**				
A. albofrenatus	*Hyla albofrenata*	22	+	Carvalho et al., 2009b
A. arildae	*Hyla albofrenata* *Hyla arildae*	22	+	Bogart, 1973; Carvalho et al., 2009b
A. ehrhardti	*Hyla ehrhardti*	22	+	Carvalho et al., 2009b
A. eugenioi	*Hyla eugenioi*	22	+	Carvalho et al., 2009b
***A. albosignatus* group**				
A. albosignatus	*Hyla albosignata*	20	+	Bogart, 1973; Carvalho et al., 2009a
A. leucopygius	*Hyla albosignata* *Hyla leucopygia*	18	+	Bogart, 1973; Carvalho et al., 2009a
***A. perviridis* group**				
A. cochranae	*Aplastodiscus cochranae*	24	+	Carvalho et al., 2009a
A. perviridis	*Aplastodiscus perviridis*	24	+	Carvalho et al., 2009a
Genus *Bokermannohyla*				
***B. circumdata* group**				
B. circumdata	*Bokermannohyla circumdata*	24	+	Catroli, 2008
B. hylax	*Bokermannohyla hylax*	24	+	Catroli, 2008
B. izecksohni	*Hyla circumdata*	24		Foresti, 1972
B. luctuosa	*Hyla luctuosa*	24, 24 + 1B	+	Baldissera Jr et al., 1993
Bokermannohyla sp.1	*Bokermannohyla* sp. 1	24	+	Catroli, 2008
***B. pseudopseudis* group**				
B. alvarengai	*Bokermannohyla alvarengai*	24	+	Catroli, 2008
B. ibitiguara	*Bokermannohyla ibitiguara*	24	+	Catroli, 2008
B. saxicola	*Bokermannohyla saxicola*	24	+	Catroli, 2008
Genus *Hypsiboas*				
***H. albopunctatus* group**				
H. albopunctatus	*Hyla albopunctata* *Hypsiboas albopunctatus*	22, 22+1B	+	Beçak, 1968; Bogart, 1973; Gruber et al., 2007
H. multifasciatus	*Hyla multifasciata*	24		Beçak, 1968
H. raniceps	*Hyla raniceps* *Hypsiboas raniceps*	24	+	Rabello, 1970; Rabello et al., 1971; Gruber et al., 2007
***H. faber* group**				
H. albomarginatus	*Hyla albomarginata* *Hypsiboas albomarginatus*	24	+	Beçak, 1968; Gruber, 2002; Nunes and Fagundes, 2008a; Carvalho et al., 2009

+ Analysis with differential staining; ● Sex chromosomes of ZZ : ZW type; ♦ Sex

(to be continue)

Species[a]	Name used in the report	2n	Differential staining	Reference
H. crepitans	*Hyla crepitans* *Hypsiboas crepitans*	24	+	Duellman and Cole, 1965; Rabello, 1970; Bogart, 1973; Gruber et al., 2007; Nunes, 2006
H. faber	*Hyla faber* *Hypsiboas faber*	24	+	Beçak, 1968; Nunes and Fagundes, 2008a; Carvalho et al., 2009
H. pardalis	*Hyla pardalis* *Hypsiboas pardalis*	24	+	Bogart, 1973; Nunes and Fagundes, 2008a
H. rosenbergi	*Hyla rosenbergi*	24		León, 1970
***H. pellucens* group**				
H. rufitelus	*Hyla rufitela*	24		Duellman, 1967
***H. pulchellus* group**				
H. bischoffi	*Hyla bischoffi* *Hyla bischoffi multilineata*	24	+	Beçak, 1968; Foresti, 1972; Raber et al., 2004
H. caingua	*Hyla caingua*	24	+	Ananias, 1996
H. guentheri	*Hyla guentheri*	24	+	Raber et al., 2004
H. joaquini	*Hyla pulchella joaquini*	24	+	Ananias, 1996
H. marginatus	*Hyla marginata*	24	+	Ananias et al., 2004
H. polytaenius	*Hyla polytaenia* *Hypsiboas polytaenius*	24		Rabello, 1970; Rabello et al., 1971; Bogart, 1973; Nunes and Fagundes, 2008b
H. prasinus	*Hyla prasina*	24	+	Beçak, 1968; Baldissera Jr et al., 1993; Ananias, 1996
H. pulchellus	*Hyla pulchella* *Hyla pulchella pulchella*	24	+	Saez and Brum, 1960; Beçak, 1968; Bogart, 1973; Ananias, 1996
H. semiguttatus	*Hyla semiguttata*	24	+	Foresti, 1972; Ananias et al., 2004
***H. punctatus* group**				
H. cinerascens	*Hyla granosa*	24		Bogart, 1973
H. punctatus	*Hyla punctata*	24	+	Bogart and Bogart, 1971; Bogart, 1973; Foresti, 1972; Anderson, 1991
***H. semilineatus* group**				
H. geographicus	*Hyla geographica*	24		Foresti, 1972
H. gr. *geographicus*	*Hyla* gr. *geographica*	24		Bogart and Bogart, 1971
H. semilineatus	*Hypsiboas semilineaus*	24	+	Nunes and Fagundes, 2008a
Tribe Dendropsophini				
Genus *Dendropsophus*				
***D. columbianus* group**				
D. carnifex	*Hyla carnifex*	30		Duellman and Trueb, 1983
***D. labialis* group**				
D. labialis	*Hyla labialis*	30		Bogart, 1973
***D. leucophyllatus* group**				
D. anceps	*Hyla anceps*	30		Foresti, 1972; Bogart, 1973
D. ebraccatus	*Hyla ebraccata*	30	+	Duellman and Cole, 1965; Kaiser et al., 1996
D. elegans	*Hyla elegans*	30	+	Gruber et al., 2005
D. leucophyllatus	*Hyla leucophyllata*	30		Bogart, 1970 and 1973; Bogart and Bogart, 1971; Foresti, 1972
D. gr. *leucophyllatus*	*Hyla* gr. *leucophyllata*	30		Bogart and Bogart, 1971

(to be continue)

Species[a]	Name used in the report	2n	Differential staining	Reference
***D. marmoratus* group**				
D. marmoratus	*Hyla marmorata*	30		Bogart and Bogart, 1971; Bogart, 1973
D. nahdereri	*Hyla nahdereri*	30	+	Gruber et al., 2005
***D. microcephalus* group**				
D. berthalutzae	*Hyla berthalutzae*	30, 30+2B	+	Foresti, 1972; Skuk and Langone, 1992; Gruber et al., 2005
D. bipunctatus	*Dendropsophus bipunctatus* *Hyla bipunctata*	30		Foresti, 1972; Bogart, 1973; Nunes, 2006
D. branneri	*Dendropsophus branneri* *Hyla branneri*	30	+	Foresti, 1972; Nunes, 2006
D. cruzi	*Hyla cruzi*	30	+	Gruber et al., 2005
D. decipiens	*Hyla decipiens*	30		Foresti, 1972; Bogart, 1973
D. elianeae	*Hyla elianeae*	30	+	Gruber et al., 2005
D. leali	*Hyla leali*	30		Bogart and Bogart, 1971; Bogart , 1973
D. meridianus	*Hyla meridiana*	30		Foresti, 1972
D. microcephalus	*Hyla microcephala* *Hyla microcephala martini* *Hyla microcephala microcephala*	30	+	Duellman and Cole, 1965; León, 1970; Bogart, 1973; Anderson, 1991; Kaiser et al., 1996
D. nanus	*Dendropsophus nanus* *Hyla nana*	30, 30+1B	+	Rabello, 1970; Rabello et al., 1971; Bogart, 1973; Skuk and Langone, 1992; Medeiros et al., 2003; Gruber et al., 2005; Medeiros et al., 2006
D. oliveirai	*Hyla oliveirai*	30		Foresti, 1972
D. phlebodes	*Hyla phlebodes*	30	+	Duellman and Cole, 1965; Duellman, 1967; Kaiser et al., 1996
D. rubicundulus	*Hyla rubicundula*	30	+	Rabello, 1970; Bogart, 1973; Gruber et al., 2005
D. sanborni	*Hyla sanborni*	30	+	Skuk and Langone, 1992; Medeiros et al., 2003; Gruber et al., 2005
***D. minutus* group**				
D. minutus	*Dendropsophus minutus* *Hyla minuta*	30	+	Rabello, 1970; Bogart and Bogart, 1971; Bogart, 1973, Gruber et al., 2005; Nunes, 2006
***D. parviceps* group**				
D. microps	*Hyla microps*	30	+	Beçak, 1968; Bogart, 1973; Gruber et al., 2005
D. parviceps	*Hyla parviceps*	30	+	Duellman and Cole, 1965; Bogart and Bogart, 1971; Bogart, 1973
D. ruschii	*Dendropsophus ruschii*	30 ♦		Nunes, 2006
D. subocularis	*Hyla subocularis*	30		Duellman, 1970
Genus *Pseudis*				
P. bolbodactyla	*Pseudis bolbodactyla*	24	+	Busin et al., 2008
P. boliviana	*Lysapsus limellus bolivianus*	24	+	Busin et al., 2006
P. caraya	*Lysapsus caraya*	24	+	Busin et al., 2006
P. cardosoi	*Pseudis* aff. *minuta*	28	+	Busin et al., 2001
P. fusca	*Pseudis fusca*	24	+	Busin et al., 2008
P. limellum	*Lysapsus limellus* *Lysapsus limellus limellus*	24	+	Barrio and Pistol de Rubel, 1970; Busin et al., 2006
P. minuta	*Pseudis minuta*	24	+	Busin et al., 2001
P. paradoxa	*Pseudis paradoxa*	24		Barrio and Pistol de Rubel, 1970

chromosomes
of XX : XY type (to be continue)
§ Cited in King, 1990; * Cited in Kuramoto, 1990;
# Cited in King (1990) and Kuramoto (1990)

Species"	Name used in the report	2n	Differential staining	Reference
P. platensis	*Pseudis paradoxa paradoxa* *Pseudis paradoxa platensis*	24	+	Busin et al., 2008
P. tocantins	*Pseudis tocantins*	24●	+	Busin et al., 2008
Genus *Scinax*				
***S. catharinae* clade**				
***S. catharinae* group**				
S. argyreornatus	*Scinax argyreornatus*	24		Nunes and Fagundes, 2008b
S. brieni	*Hyla brieni*	24		Bogart, 1973
S. catharinae	*Hyla catharinae*	24		Bogart, 1973
***S. perpusillus* group**				
S. perpusillus	*Hyla perpusilla*	24		Bogart, 1973
***S. ruber* clade**				
***S. rostratus* group**				
S. boulengeri	*Hyla boulengeri*	24		Duellman, 1967
S. garbei	*Hyla garbei*	24		Bogart and Bogart, 1971
S. rostratus	*Hyla rostrata*	24		Bogart, 1973
Species of *S. ruber* clade unassigned to a species group				
S. alter	*Scinax alter*	24	+	Nunes and Fagundes, 2008b
S. cuspidatus	*Hyla cuspidata*	24		Foresti, 1972
S. duartei	*Hyla duartei*	24		Foresti, 1972
S. elaeochrous	*Hyla elaeochroa* *Ololygon elaeochroa*	24	+	Duellman, 1967; Anderson, 1991
S. funereus	*Hyla funerea*	24		Bogart and Bogart, 1971
S. fuscomarginatus	*Hyla fuscomarginata*	24		Rabello, 1970; Rabello et al., 1971
S. fuscovarius	*Hyla trachythorax* *Ololygon fuscovaria* *Scinax fuscovarius*	24, 24+B	+	Rabello, 1970; Anderson, 1991; Baldissera Jr et al., 1993; Kasahara et al., 2003
Scinax sp. (gr. *ruber*)	*Scinax* sp. (gr. *ruber*)	24		Nunes, 2006; Nunes and Fagundes, 2008b
S. hayii	*Hyla hayii*	24	+	Beçak, 1968; Baldissera Jr et al., 1993
S. perereca	*Scinax perereca*	24	+	Pombal Jr et al., 1995
S. squalirostris	*Hyla squalirostris*	24		Barrio and Pistol de Rubel, 1970; Foresti, 1972
S. staufferi	*Hyla staufferi* *Ololygon staufferi*	24	+	Duellman, 1967; Anderson, 1991
Genus *Sphaenorhynchus*				
S. planicola	*Sphaenorhynchus planicola*	24		Foresti, 1972
Tribe Hylini				
Genus *Acris*				
A. crepitans	*Acris crepitans*	22, 22 + 1 to 5B		Bushnell et al., 1939; Nur and Nevo, 1969; Bogart, 1970 and 1973
Acris blanchardi	*Acris crepitans blanchardi*	22		Cole, 1966; Duellman and Cole, 1965
A. gryllus	*Acris gryllus*	22	+	Bushnell et al., 1939; Anderson, 1991

(to be continue)

Species[a]	Name used in the report	2n	Differential staining	Reference
Genus *Anotheca*				
A. spinosa	*Anotheca coronata* *Anotheca spinosa*	24		Duellman and Cole, 1965; Sessions, 1978
Genus *Charadrahyla*				
C. chaneque	*Hyla chaneque*	24		Duellman, 1970
Genus *Diaglena*				
D. spatulatus	*Diaglena reticulata*; *Diaglena spatulata*; *Triprion spatulatus*	24		Duellman and Cole, 1965; Duellman, 1970
Genus *Duellmanohyla*				
D. ignicolor	*Ptychohyla ignicolor*	24		Duellman and Cole, 1965
D. rufioculis	*Hyla rufioculis*	24		Duellman, 1967
D. uranochroa	*Hyla uranochroa*	24		León, 1970
Genus *Exerodonta*				
***E. sumichrasti* group**				
E. smaragdina	*Hyla smaragdina*	24		Duellman, 1970
Genus *Hyla*				
***H. arborea* group**				
H. annectans	*Hyla annectans*	24	+	Li et al., 1981*
H. arborea	*Hyla arborea* *Hyla arborea arborea* *Hyla arborea schelknownikovi*	24	+	Morescalchi, 1965; Ullerich, 1970; Schmid, 1978; Bogart, 1973; Anderson, 1991, Martirosyan and Stepanian, 2007
H. chinensis	*Hyla chinensis*	24	+	Anderson, 1991
H. hallowellii	*Hyla hallowellii*	24	+	Kuramoto et al., 1974; Anderson, 1991
H. immaculata	*Hyla arborea immaculata*	24	+	Tang et al., 1984*
H. meridionalis	*Hyla meridionalis*	24	+	Anderson, 1991
H. savignyi	*Hyla savignyi*	24 ♦	+	Bogart, 1973; Anderson, 1991; Al-Sheri and Al-Salech, 2005; Martirosyan and Stepanian, 2007
***H. cinerea* group**				
H. cinerea	*Hyla cinerea*	24	+	Bushnell et al., 1939; Schmid, 1978 and 1980; Wiley, 1982; Anderson and Moler, 1986; Anderson, 1991; Wiley et al., 1992
H. gratiosa	*Hyla gratiosa*	24	+	Bogart, 1973; Wiley, 1982; Anderson, 1991
H. squirella	*Hyla squirella*	24 ●	+	Bogart, 1973; Wiley, 1982; Anderson, 1991; Wiley et al., 1992
***H. eximia* group**				
H. andersonii	*Hyla andersonii*	24	+	Duellman and Cole, 1965; Wasserman, 1970; Wiley, 1982; Anderson and Moler, 1986; Anderson, 1991
H. arenicolor	*Hyla arenicolor*	24	+	Duellman and Cole, 1965; Wasserman, 1970; Anderson, 1991
H. euphorbiacea	*Hyla euphorbiacea*	24	+	Duellman and Cole, 1965; Anderson, 1991
H. eximia	*Hyla eximia*	24	+	Duellman and Cole, 1965; Anderson, 1991
H. japonica	*Hyla arborea japonica* *Hyla japonica*	24 ♦	+	Yosida, 1957; Matsuda, 1963*; Seto, 1964; Seto and Makino, 1964; Kuramoto et al., 1974; Anderson, 1991; Miura, 1995

(to be continue)

Species[a]	Name used in the report	2n	Differential staining	Reference
H. plicata	*Hyla lafrentzi*	24		Duellman and Cole, 1965
H. suweonensis	*Hyla suweonensis*	24		Kuramoto, 1980
***H. versicolor* group**				
H. avivoca	*Hyla avivoca*	24	+	Bushnell et al., 1939; Wiley, 1982; Anderson, 1991
H. chrysoscelis	*Hyla chrysoscelis*	24	+	Bogart and Wasserman, 1972; Bogart, 1973; Wiley, 1982, 1983* and 2003; Wiley et al., 1989; Anderson, 1991; Wiley et al., 1992; Wiley and Little, 2000
H. versicolor	*Hyla versicolor*	4x=48	+	Bushnell et al., 1939; Wasserman, 1970; León, 1970; Bogart and Wasserman, 1972; Wiley, 1982; Wiley et al., 1989; Anderson, 1991; Wiley et al., 1992; Wiley and Little, 2000
Species of *Hyla* unassigned to a species group				
H. femoralis	*Hyla femoralis*	24 ♦	+	Wiley, 1982 and 2003; Anderson and Moler, 1986; Anderson, 1991; Wiley et al., 1992; Schmid and Steinlein, 2003
Genus *Isthmohyla*				
***I. pictipes* group**				
I. lancasteri	*Hyla lancasteri*	24	+	Anderson, 1991
I. pictipes	*Hyla pictipes*	24		Duellman, 1970
I. rivularis	*Hyla rivularis*	24		León, 1970
I. tica	*Hyla tica*	24		León, 1970
***I. pseudopuma* group**				
I. angustilineata	*Hyla angustilineata*	24		León, 1970
I. pseudopuma	*Hyla pseudopuma*	24		León, 1970
Genus *Plectrohyla*				
***P. bistincta* group**				
P. arborescandens	*Hyla arborescandens* *Hyla hazelae*	24		Duellman and Cole, 1965; Duellman, 1970
P. pentheter	*Hyla bistincta* *Hyla pentheter*	24		Duellman and Cole, 1965; Duellman, 1967 and 1970
P. robertsorum	*Hyla robertsorum*	24		Duellman and Cole, 1965
***P. guatemalensis* group**				
P. ixil	*Plectrohyla ixil*	24		Duellman, 1970
P. sagorum	*Plectrohyla sagorum*	24		Duellman, 1970
Genus *Pseudacris*				
***P. crucifer* group**				
P. crucifer	*Hyla crucifer* *Hyla crucifer crucifer*	24	+	Duellman and Cole, 1965; Wiley, 1982
***P. ornata* group**				
P. ornata	*Pseudacris ornata*	24	+	Schmid, 1978; Wiley, 1982; Anderson, 1991
P. streckeri	*Pseudacris streckeri*	24		Bogart, 1973
***P. nigrita* group**				
P. brachyphona	*Pseudacris brachyphona*	24	+	Duellman and Cole, 1965; Anderson, 1991

(to be continue)

Species[a]	Name used in the report	2n	Differential staining	Reference
P. brimleyi	*Pseudacris brimleyi*	24	+	Wiley, 1982; Anderson, 1991; Wiley et al., 1992
P. clarkii	*Pseudacris clarkii*	24		Bogart, 1973
P. feriarum	*Pseudacris triseriata feriarum* *Pseudacris triseriata kalmi*	24	+	Duellman and Cole, 1965; Wiley, 1982;
P. nigrita	*Pseudacris nigrita*	24	+	Anderson, 1991; Wiley et al., 1992
P. triseriata	*Pseudacris triseriata* *Pseudacris triseriata triseriata*	24	+	Duellman and Cole, 1965; Anderson, 1991
***P. regilla* group**				
P. cadaverina	*Hyla cadaverina* *Hyla californiae*	24	+	Maxson and Jameson, 1968; Anderson, 1991
P. regilla	*Hyla regilla*	24	+	Morescalchi, 1965; Maxson and Jameson, 1968; Bogart, 1970; Anderson, 1991
Genus *Ptychohyla*				
P. erythromma	*Hyla erythromma*	24		Duellman, 1967
P. legleri	*Hyla legleri*	24		Duellman, 1967
P. leonhardschultzei	*Ptychohyla leonhardschultzei*	24		Duellman, 1970
Genus *Smilisca*				
S. baudinii	*Hyla baudinii* *Smilisca baudinii*	24	+	Duellman and Cole, 1965; Duellman and Trueb, 1966; León, 1970; Bogart, 1973; Cole, 1974; Anderson, 1991
S. cyanosticta	*Smilisca cyanosticta*	24		Duellman and Cole, 1965; Duellman and Trueb, 1966
S. fodiens	*Pternohyla fodiens*	24		Duellman and Cole, 1965; Cole, 1974
S. phaeota	*Smilisca phaeota*	24		Duellman and Trueb, 1966
S. puma	*Smilisca puma*	24		Duellman and Trueb, 1966
S. sila	*Smilisca sila*	24		Duellman and Trueb, 1966
S. sordida	*Hyla sordida* *Smilisca sordida*	24		Duellman and Trueb, 1966; Bogart, 1973
Genus *Tlalocohyla*				
T. loquax	*Hyla loquax*	24		Duellman, 1970
T. smithii	*Hyla smithii*	24	+	Duellman and Cole, 1965; Anderson, 1991
Genus *Triprion*				
T. petasatus	*Triprion petasatus*	24		Duellman and Cole, 1965; Cole, 1974
Tribe Lophiohylini				
Genus *Aparasphenodon*				
A. brunoi	*Aparasphenodon brunoi*	24	+	Foresti, 1972; Bogart, 1973; Kasahara et al., 2003; Nunes and Fagundes, 2008b
Genus *Argenteohyla*				
A. siemersi	*Argenteohyla siemersi pederseni*	24	+	Morand and Hernando, 1996
Genus *Corythomantis*				
C. greeningi	*Corythomantis greeningi*	24	+	Kasahara et al., 2003
Genus *Itapotihyla*				
I. langsdorffii	*Osteocephalus langsdorffii*	24	+	Foresti, 1972; Kasahara et al., 2003; Nunes and Fagundes, 2008b
Genus *Osteocephalus*				
O. taurinus	*Osteocephalus taurinus*	24	+	Anderson, 1996

(to be continue)

Species[a]	Name used in the report	2n	Differential staining	Reference
Genus *Osteopilus*				
O. brunneus	*Hyla brunnea* *Osteopilus brunneus*	34	+	Cole, 1974; Anderson, 1996
O. dominicensis	*Osteopilus dominicensis*	24	+	Anderson, 1996
O. marianae	*Hyla marianae*	24	+	Anderson, 1996
O. septentrionalis	*Hyla septentrionalis* *Osteopilus septentrionalis*	24	+	Duellman and Cole, 1965; Bogart, 1973; Cole, 1974; Schmid, 1978 and 1980; Anderson, 1996
O. wilderi	*Hyla wilderi*	28	+	Anderson, 1996
Genus *Trachycephalus*				
Trachycephalus sp.	*Trachycephalus* sp.	24		Bogart, 1973
T. mesophaeus	*Phrynohyas mesophaea*	24		Foresti, 1972
T. venulosus	*Phrynohyas spilomma* *Phrynohyas venulosa*	24		Duellman and Cole, 1965; Rabello, 1970; Bogart and Bogart, 1971; Bogart, 1973
Subfamily Pelodryadinae				
Genus *Litoria*				
***L. adelaidensis* group**				
L. adelaidensis	*Litoria adelaidensis*	26	+	King, 1980a
***L. aurea* group**				
L. alboguttata	*Cyclorana alboguttatus* *Litoria alboguttata*	26		Morescalchi and Ingram, 1974; King, 1980b
L. aurea	*Litoria aurea*	26		King, 1980b
L. cyclorhyncha	*Litoria cyclorhynchus*	26		King, 1980b
L. moorei	*Litoria moorei*	26	+	King, 1980a; King et al., 1990
L. raniformis	*Litoria raniformis*	26	+	Tyler et al., 1978; King, 1980a; King et al., 1990
***L. bicolor* group**				
L. bicolor	*Litoria bicolor*	26	+	Menzies and Tippett, 1976; King, 1980b
L. cooloolensis	*Litoria cooloolensis*	26	+	King, 1980a and 1980b
L. contrastens	*Litoria contrastens*	26		Menzies and Tippett, 1976
L. fallax	*Litoria fallax* *Litoria glauerti*	26		Morescalchi, 1979; King, 1980b
L. olongburensis	*Litoria olongburensis*	26	+	King, 1980a
***L. brevipalmata* group**				
L. latopalmata	*Hyla latopalmata* *Litoria latopalmata*	26		Bogart, 1973; King, 1980b
***L. caerulea* group**				
L. caerulea	*Litoria caerulea*	26	+	Stephenson and Stephenson, 1970; Menzies and Tippett, 1976; King, 1980b and 1990;
L. infrafrenata	*Litoria infrafrenata*	24	+	Menzies and Tippett, 1976; King, 1980a
L. splendida	*Litoria splendida*	26	+	King, 1980b
***L. chloris* group**				
L. chloris	*Litoria chloris*	26	+	Morescalchi and Ingram, 1974; King, 1980a
***L. citropa* group**				
L. citropa	*Litoria citropa*	26		King, 1990

(to be continue)

Species[a]	Name used in the report	2n	Differential staining	Reference
L. pearsoniana	*Litoria pearsoni*	26	+	King, 1980a
L. phyllochroa	*Litoria phyllochroa*	26	+	Stephenson and Stephenson, 1970; King, 1980a
L. subglandulosa	*Litoria glandulosa*	26		King, 1980b
***L. coplandi* group**				
L. coplandi	*Litoria coplandi*	26	+	Morescalchi, 1979; King, 1980b; King,1990
***L. dorsalis* group**				
L. microbelos	*Litoria microbelos*	26		King, 1980b
L. timida	*Litoria timida*	26		Menzies and Tippett, 1976
***L. eucnemis* group**				
L. eucnemis	*Litoria eucnemis* *Litoria serrata*	26		King, 1980b and 1990
L. genimaculata	*Litoria genimaculata*	24		Menzies and Tippett, 1976; King, 1980b
***L. ewingii* group**				
L. ewingii	*Litoria ewingii*	26		Woodruff, 1972; King, 1980b
L. jervisiensis	*Litoria jervisiensis*	26		King, 1980b
L. verreauxii	*Litoria verreauxii*	26		King, 1980b
***L. gracilenta* group**				
L. gracilenta	*Litoria gracilenta*	26		Menzies and Tippett, 1976; King, 1980b
***L. latopalmata* group**				
L. freycineti	*Litoria freycineti*	26		King, 1980b
L. inermis	*Litoria inermis*	26	+	King, 1980b and 1990
L. nigrofrenata	*Litoria nigrofrenata*	26		King, 1980b
L. tornieri	*Litoria tornieri*	26		King, 1980b
L. watjulumensis	*Litoria watjulumensis*	26		King, 1980b
***L. lesueurii* group**				
L. booroolongensis	*L. booroolongensis*	26	+	Donnellan and Mahony, 2004
L. jungguy	*Litoria jungguy*	26	+	Donnellan and Mahony, 2004
L. lesueurii	*Litoria lesueurii*	26	+	King, 1980a; Donnellan and Mahony, 2004
***L. meiriana* group**				
L. meiriana	*Litoria meiriana*	26	+	King, 1980a
***L. nannotis* group**				
L. nannotis	*Litoria nannotis*	26	+	King, 1987
L. rheocola	*Litoria rheocolus*	26		King, 1980b
***L. nasuta* group**				
L. nasuta	*Litoria nasuta*	26		Morescalchi and Ingram, 1974; Menzies and Tippett, 1976; King, 1980b
***L. nigropunctata* group**				
L. nigropunctata	*Litoria nigropunctata*	26		Menzies and Tippett, 1976
L. vocivincens	*Litoria vocivincens*	26		Menzies and Tippett, 1976
***L. peronii* group**				
L. amboinensis	*Litoria amboinensis*	26		Menzies and Tippett, 1976
L. darlingtoni	*Hyla darlingtoni* *Litoria darlingtoni*	26		Duellman, 1967; Menzies and Tippett, 1976

(to be continue)

Species[a]	Name used in the report	2n	Differential staining	Reference
L. peronii	*Litoria peronii*	26	+	Morescalchi, 1979; King, 1980a
L. rothii	*Litoria rothii*	26	+	King, 1980b and 1985§;
***L. pratti* group**				
L. angiana	*Hyla angiana* *Litoria angiana*	26, 30		Duellman, 1967; Menzies and Tippett, 1976
L. arfakiana	*Hyla arfakiana* *Litoria arfakiana*	26		Duellman, 1967; Menzies and Tippett, 1976; Kuramoto and Allison, 1991
L. becki	*Hyla becki*	26		Duellman, 1967
L. modica	*Litoria modica*	26		Menzies and Tippett, 1976
L. wollastoni	*Litoria wollastoni*	26		Menzies and Tippett, 1976; Kuramoto and Allison, 1991
***L. rubella* group**				
L. congenita	*Litoria congenita*	26		Menzies and Tippett, 1976
L. dentata	*Litoria dentata*	26		Morescalchi, 1979; King, 1980b and 1990
L. pygmaea	*Litoria pygmaea*	26		Menzies and Tippett, 1976
L. rubella	*Litoria rubella*	26	+	Menzies and Tippett, 1976; Morescalchi, 1979; King, 1980b
***L. thesaurensis* group**				
L. impura	*Litoria impura*	26		Menzies and Tippett, 1976
L. thesaurensis	*Litoria thesaurensis*	26		Menzies and Tippett, 1976; Kuramoto and Allison, 1991
Species of *Litoria* unassigned to a species group				
L. australis	*Cyclorana australis*	26	+	King et al., 1979
L. brevipes	*Cyclorana brevipes*	26		King et al., 1979
L. cheesmanae	*Nyctimystes cheesmani*	26		Menzies and Tippett, 1976
L. cryptotis	*Cyclorana cryptotis*	26	+	King et al., 1979
L. dahlii	*Litoria dahlii*	26	+	Tyler et al., 1978; King, 1980b and 1990
L. dayi	*Nyctimystes hosmeri*	26		King, 1990
L. daymani	*Nyctimystes daymani*	26		Menzies and Tippett, 1976
L. foricula	*Nyctimystes foricula*	26		Duellman, 1967; Kuramoto and Allison, 1991
L. humeralis	*Nyctimystes humeralis*	26		Menzies and Tippett, 1976
L. kubori	*Nyctimystes kubori*	26		Duellman, 1967; Menzies and Tippett, 1976
L. longipes	*Cyclorana longipes*	26		King et al., 1979
L. maini	*Cyclorana maini*	26		King et al., 1979
L. montana	*Nyctimystes montana*	26		Menzies and Tippett, 1976
L. gr. *montana*	*Nyctimystes* gr. *montana*	26		Menzies and Tippett, 1976
L. novaehollandiae	*Cyclorana novaehollandiae*	26	+	King, 1990
L. papua	*Nyctimystes papua*	26		Duellman, 1967; Menzies and Tippett, 1976
L. platycephala	*Cyclorana platycephalus*	26	+	King et al., 1979; King, 1985§ and 1990
L. pulchra	*Nyctimystes pulchra*	26		Kuramoto and Allison, 1991
L. semipalmata	*Nyctimystes semipalmata*	26		Duellman, 1967
L. verrucosa	*Cyclorana verrucosus*	26		King et al.,1979
L. wilcoxii	*Litoria wilcoxii*	26	+	Donnellan and Mahony, 2004
Subfamily Phyllomedusinae				
Genus *Agalychnis*				
A. annae	*Agalychnis annae*	26		León, 1970

(conclusion)

Species[a]	Name used in the report	2n	Differential staining	Reference
A. callidryas	*Agalychnis callidryas* *Phyllomedusa callidryas callidryas* *Phyllomedusa helenae*	26	+	Duellman and Cole, 1965; León, 1970; Schmid et al., 1995
Genus *Cruziohyla*				
C. calcarifer	*Phyllomedusa calcarifer*	26		Duellman and Cole, 1965
Genus *Hylomantis*				
***H. buckleyi* group**				
H. lemur	*Phyllomedusa lemur*	26		León, 1970
Genus *Pachymedusa*				
P. dacnicolor	*Pachymedusa dacnicolor* *Phyllomedusa dacnicolor*	26	+	Duellman and Cole, 1965; Cole, 1971; Schmid, 1980
Genus *Phasmahyla*				
P. exilis	*Phasmahyla exilis*	26 ♦		Nunes and Fagundes, 2008b
Genus *Phyllomedusa*				
***P. burmeisteri* group**				
P. burmeisteri	*Phyllomedusa burmeisteri*	26	+	Batistic et al., 1975; Batistic, 1989
P. distincta	*Phyllomedusa distincta*	26	+	Batistic, 1989; Haddad et al., 1994
P. iheringii	*Phyllomedusa iheringii*	26	+	Batistic, 1989
P. tetraploidea	*Phyllomedusa* sp. *Phyllomedusa burmeisteri* *Phyllomedusa tetroploidea*	4x=52	+	Beçak et al., 1970; Barrio, 1976; Batistic, 1989; Haddad et al., 1994
***P. hypochondrialis* group**				
P. ayeaye	*Phyllomedusa ayeaye*	26	+	Batistic, 1989
P. hypochondrialis	*Phyllomedusa hypochondrialis*	26	+	Foresti, 1972; Batistic, 1989
P. rohdei	*Phyllomedusa rohdei*	26, 40 ♦	+	Batistic, 1989; Nunes and Fagundes, 2008b; Paiva et al, 2010 in press; Morand and Hernando, 1997
***P. iheringii* group**				
P. azurea	*Phyllomedusa azurea*	26	+	Barrio, 1976
***P. tarsius* group**				
P. camba	*Phyllomedusa camba*	26	+	Paiva et al., 2010 in press
P. boliviana	*Phyllomedusa pailona*	26		Barrio, 1976
P. tarsius	*Phyllomedusa tarsius*	26		Bogart, 1973
P. sauvagii	*Phyllomedusa sauvagii*	26	+	Barrio, 1976; Morand and Hernando, 1997
P. venusta	*Phyllomedusa venusta*	26		Duellman, 1970
Species of *Phyllomedusa* unassigned to a species group				
P. tomopterna	*Phyllomedusa tomopterna*	26		Batistic, 1989
P. palliata	*Phyllomedusa palliata*	26		Bogart, 1973