An Annotated Catalog of the Type Specimens of Amphibia in the Collection of the Museo Civico Di Storia Naturale, Milan, Italy

Authors: Blackburn, David C., and Scali, Stefano

Source: Herpetological Monographs, 28(1) : 24-45

Published By: The Herpetologists' League

URL: https://doi.org/10.1655/HERPETOLOGICA-D-13-00008

Herpetological Monographs, 28 2014, 24–45

AN ANNOTATED CATALOG OF THE TYPE SPECIMENS OF AMPHIBIA IN THE COLLECTION OF THE MUSEO CIVICO DI STORIA NATURALE, MILAN, ITALY

David C. Blackburn[1,3] and Stefano Scali[2]

[1] *Department of Vertebrate Zoology and Anthropology, California Academy of Sciences, San Francisco, CA 94118, USA*
[2] *Museo Civico di Storia Naturale, Corso Venezia 55, I-20121, Milan, Italy*

Abstract: We present a detailed description of the type specimens of amphibians (frogs and salamanders) held in the scientific research collections of the Museo Civico di Storia Naturale in Milan, Italy. These collections are historically important because of their rich sampling from the early 20th Century of present-day Libya, Somalia, Ethiopia, and Eritrea, countries for which scientific collections are generally uncommon. Further, in the mid-19th Century the scientist Giorgio Jan amassed in Milan a diverse collection of amphibian and reptile specimens from institutions across Europe and the United States. There is a long history in the scientific literature stating that these specimens, brought together by Jan, were lost or destroyed due to the Allied bombing of Milan in 1943. We report the results of a thorough survey of the amphibian collection, revealing many type specimens previously thought lost, as well as several specimens from Jan's mid-19th Century collection believed to have been destroyed. Among the latter are specimens corresponding to three nomina nuda created by Jan in an 1857 catalog. We provide details for all type specimens as well as a short synopsis of the history and taxonomic status of each. The scientific collections of amphibians in Milan contain type specimens of one salamander, *Hydromantes italicus bonzanoi*, and 17 frog species of which three are not currently considered synonyms of older names: *Arthroleptis elegans*, *Arthroleptis–Phrynobatrachus sciangallarum*, *Arthroleptis–Phrynobatrachus zavattarii*, *Bufo gardoensis*, *Bufo incertus*, *Bufo sibilai*, *Fichteria somalica*, *Hyperolius zavattarii*, *Kassina somalica*, *Megalixalus parkeri*, *Rana* (*Pyxicephalus*) *cimmarutai*, *Rana cornii*, *Rana fichteri*, *Rana oxyrhynchus migiurtina*, *Rana somalica*, *Rana zavattarii*, and *Rappia rossii*.

Key words: Africa; Anura; Caudata; Giorgio Jan; Holotype; Paratype; Syntype

Italian scientific research collections of amphibians and reptiles date to the late 18th Century and have particular strengths in Europe, Africa, and South America (Barbagli, 2010; Mazzotti and Miserocchi, 2010). From the mid-19th to early 20th Century, the Museo Civico di Storia Naturale in Milan (MSNM) contained one of the world's foremost herpetological collections, including that brought together by Giorgio Jan (1791–1866) for his synoptic research on snakes (Conci, 1967; Barbagli, 2010; Scali, 2010). Among Italian collections, the MSNM also stands out for its collections of amphibians and reptiles from continental Africa during the early 20th century (Mazzotti and Miserocchi, 2010). The MSNM is particularly important due to its strengths in collections from present-day Libya, Somalia, Ethiopia, and Eritrea, dating largely to Italian occupation of these regions in the 1920s and 1930s, and mostly collected or brought together at MSNM by Giuseppe Scortecci (1898–1973; Visconti, 1988; Scali, 2010). These collections have played an important role in the study of amphibians and reptiles from these African regions (e.g., Scortecci, 1933, 1936; Lanza, 1981; Largen, 2001b; Largen and Spawls, 2006, 2010). The MSNM collections are also of note because much of the collections were lost when Allied forces bombed the museum in 1943 (Parisi, 1944). Since that time, components of the MSNM herpetological collections, especially type specimens, have been frequently cited as having been either lost or destroyed (Conci, 1967; Frost, 1985; Visconti, 1988; Largen, 2001b; Barbagli, 2010; Scali, 2010).

Here we build on previous work on the MSNM herpetological collections by Leonardi et al. (1995) and Scali (1996, 2010) by providing detailed information on all amphibian type specimens presently in the collections, including for specimens not previously discussed. In addition, we discuss amphibian specimens from the mid-19th Century collection assembled by Giorgio Jan that were discovered during our survey.

[3] Correspondence: e-mail, dblackburn@calacademy.org

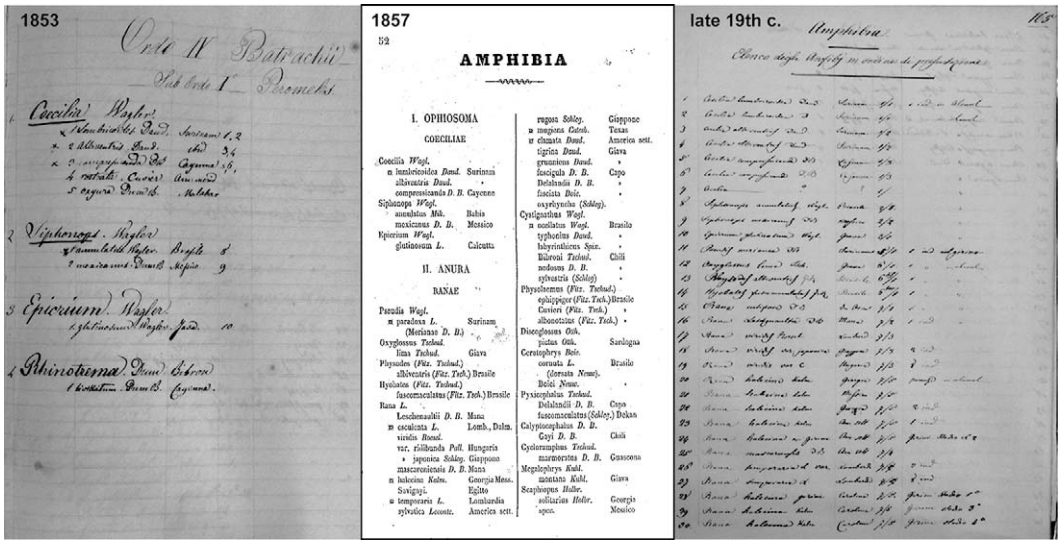

FIG. 1.—Examples from the unpublished and published catalogs of the amphibian collection of the Museo Civico di Storia Naturale in Milan. From left to right: 1853 unpublished catalog in the museum's archives; first page of the amphibian section of Jan's (1857) catalog; undated late-19th Century unpublished catalog in the museum's archives that often contains additional details to the 1853 catalog as well as accessions from the late-19th Century.

The latter specimens correspond to taxa cited in Jan's (1857) catalog of the MSNM amphibian and reptile collections, including several recognized as nomina nuda (Frost, 2013).

MATERIALS AND METHODS

During 2011 and 2012, we conducted a thorough survey of the amphibian collections of the Museo Civico di Storia Naturale (MSNM) in Milan, Italy. We focused particularly on locating type specimens at MSNM. While type specimens have been stored separately, our survey revealed many "lost" type specimens in the collection. We identified specimens of interest by matching information in the original taxonomic descriptions to a combination of catalog numbers, locality, associated collection data, or any combination, preserved in or on specimen jars. In the 1980s a uniform numbering system was implemented across the vertebrate collections of MSNM, but the previous catalog numbers cited in some studies are retained on the labels. All of the amphibian specimens now have a catalog number preceded by "MSNM Am." For the historical collections cited in Jan's (1857) catalog, we also relied on an unpublished, handwritten catalog (dated as 1853) preserved in the MSNM historical archives. This catalog seems to have served as the template for Jan's *Cenni sul Museo Civico di Milano ed Indice sistematico dei rettili ed anfibi esposti nel medesimo* published in 1857 because the taxonomy and ordering of taxa are highly similar to the published catalog (Fig. 1). While catalog numbers do not appear in the Jan (1857) catalog, information on labels on, or in, several jars found during our survey matches both the handwritten and printed catalogs and leaves little doubt as to the correspondence. In addition a second, undated handwritten catalog provides a reorganization of the information in the 1853 catalog (sometimes with additional information) as well as information on the year of accessioning of material deposited in the MSNM during the mid–late 19th and early 20th centuries (ca. 1866–1915; Fig. 1). In the 1853 catalog, the numbers following species names appear to be early catalog numbers and correspond to numbers on jars of species with the same name in the MSNM amphibian collection remaining from the 19th Century. Comparison between the two cata-

logs reveals that some information added to the catalog, dated as 1853, must have been added later; some taxa and catalog numbers are recorded as having been accessioned in the late 19th Century in the second, undated catalog. Interestingly, the taxa that appear likely to have been added include many of the nomina nuda from Jan (1857). Taken together, the two catalogs prove a useful resource for triangulating information on the 19th Century MSNM herpetology collections, most of which are now lost.

For each species we provide the taxon and authority, details on specimens given in the original scientific description, current collection catalog information, and also remarks on the taxonomic history and other pertinent information; accounts are organized by current taxonomy (family-level taxonomy following Blackburn and Wake, 2011). To facilitate comparisons to the literature, we also provide the snout–vent length (SVL) of specimens (measured using digital calipers to the nearest 0.1 mm). When available in the present-day collections, we also provide details on previous MSNM numbers for these type specimens. We provide updated locality names and geospatial coordinates based on the GEOnet Names Server of the United States National Geospatial-Intelligence Agency (http://earth-info.nga.mil/gns/html/index.html).

Taxonomic Accounts

Amphibian Taxa With Type Material In Museo Civico Di Storia Naturale Di Milano

Anura Fischer von Waldheim, 1813
Bufonidae Gray, 1825
Bufo gardoensis *Scortecci, 1932b*

Current taxonomy.—*Poyntonophrynus lughensis* (Loveridge, 1932).

Original publication information.—"2 ♂ (A, B) 4 ♀ (C, D, E, F) Gardo Migiurtinia [Qardho, Puntland State of Somalia; 9.505062 49.084944] 9–20. Agosto 1931" (Scortecci, 1932b); SVL of "Tipo ♂ A" given as 31 mm by Scortecci (1932b) and SVLs of females ranging from 28–42 mm; specimen number given as "N. 666" by Scortecci (1933).

Current catalog information.—One holotype and five paratypes (see Remarks): MSNM Am 343 (female, SVL = 33.9 mm), 345 (?female, SVL = 32.8 mm), 346 (female, SVL = 42.4 mm), 347 (sex unknown, SVL = 30.8 mm), 348 (sex unknown, SVL = 34.5 mm), and 349 (?male, SVL = 27.1 mm).

Remarks.—Scortecci (1932b) described *Bufo gardoensis* (Fig. 2A,D) based on six specimens (all of which remain) from Gardo Migiurtinia and considered this species to be similar to *B. taitanus* (now *Mertensophryne taitana*; Peters 1878). Both Tandy and Keith (1972) and Balletto et al. (1978) considered *B. gardoensis* a junior synonym of *Bufo* (now *Poyntonophrynus*) *lughensis*, which was followed by Lanza (1981), Frost (1985), and presumably by Lanza (1990); yet Tandy and Keith (1972) expressed uncertainty about this assignment by using "?". *Bufo gardoensis* was further discussed by both Cherchi (1958) and Scortecci (1933), the latter providing additional information on the types. Scali (2010) lists a syntype, but Scortecci (1932b) did treat an individual specimen from Gardo as "Tipo ♂ A", and the SVL for this specimen is given as 31 mm; the SVL of other specimens ranged from 28 to 42 mm SVL. We treat these six specimens as a holotype and five paratypes, though it is unclear which specimen represents Scortecci's type specimen (possibly MSNM Am 347, measured here at 30.8 mm SVL).

Bufo incertus *Scortecci, 1933*

Current taxonomy.—*Amietophrynus steindachneri* (Pfeffer, 1893).

Original publication information.—"N. 670 – 1 juv. – Villaggio Duca degli Abruzzi [Jowhar, Somalia; 2.780868 45.500484]. Aprile 1929"; SVL given as 26 mm (Scortecci, 1933).

Current catalog information.—Holotype: MSNM Am 604 (ex. 670, ?female, SVL = 25.6 mm).

Remarks.—Scortecci (1933) described *Bufo incertus* (Fig. 2B,E) for a single juvenile specimen. However, he explicitly expressed his uncertainty about recognizing this as a new taxon because it was based on a single juvenile specimen. *Bufo incertus* was considered a junior synonym of *Bufo* (now *Amietophrynus*) *steindachneri* by both Tandy and Keith (1972) and Lanza (1981; and presumably Lanza, 1990).

FIG. 2.—*Bufo gardoensis* Scortecci, 1932 (A,D; MSNM AM 347, syntype), *Bufo incertus* Scortecci, 1933 (B,E; MSNM Am 604, holotype), *Bufo sibilai* Scortecci, 1929 (C,F; MSNM Am 273, syntype). Scale bars = 10 mm.

Bufo sibiliai *Scortecci, 1929*

Current taxonomy.—*Amietophrynus blanfordii* (Boulenger, 1882).

Original publication information.—"(No. 589) 1 ♂, 1 juv. Regione Fil-Fil, presso Ghinda [Ghinda, Eritrea; 15.449167 39.088611] – Dr. E. Sibilia *l. d.*" (Scortecci, 1929); SVL of male given as 40 mm and of juvenile as 23 mm by Scortecci (1929).

Current catalog information.—Two syntypes: MSNM Am 272 (ex. 589; juvenile, SVL = 20.3 mm), 273 (ex. 589; ?male, SVL = 36.6 mm).

Remarks.—Scortecci (1929) described *Bufo sibiliai* (Fig. 2C,F) based on two specimens from near Ghinda in the Fil-Fil region. Tandy and Keith (1972) considered this a junior synonym of *Bufo* (now *Amietophrynus*) *blanfordii* without comment (see also Tandy and Feener, 1985). Followed by Largen (1997, 2001b) and Lanza (1990); no type specimens were noted by Largen (1997, 2001b). Contra Scali (2010), the authority is Scortecci (1929), not Scortecci (1933).

Hyperoliidae Laurent, 1943

Hyperolius zavattarii *Scortecci, 1943*

Current taxonomy.—*Hyperolius balfouri* (Werner, 1908).

Original publication information.—"Pozzi di Gondaraba [Gondaraba, Ethiopia; 4.966667

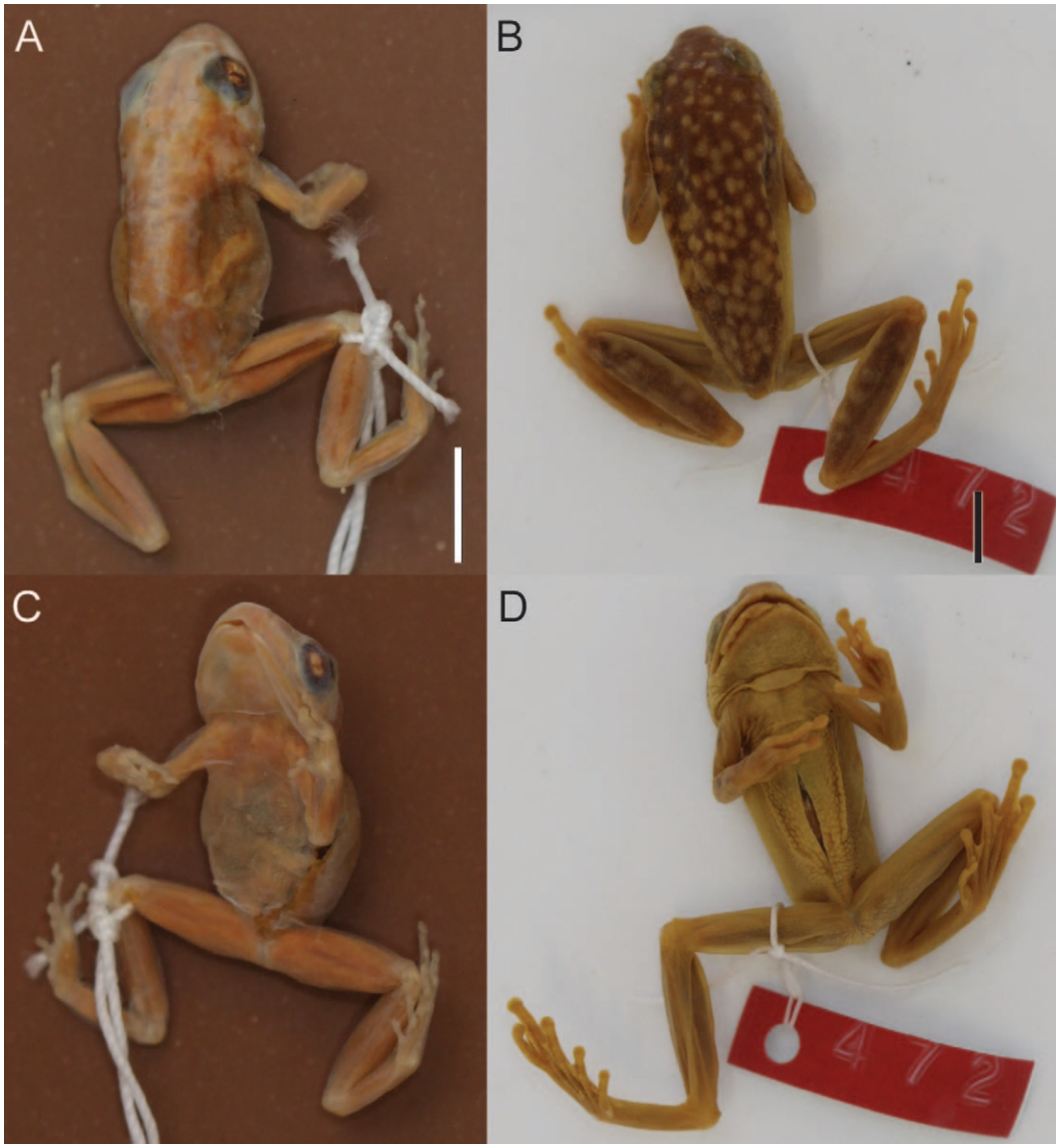

FIG. 3.—*Hyperolius zavattarii* Scortecci, 1943 (A,C; MSNM Am 284, holotype), *Rappia Rossii* Calabresi, 1925 (B,D; MSNM Am 472, syntype). Scale bars = 5 mm.

36.816667]. 31 maggio 1939. 1 ♀" (Scortecci, 1943); specimen number not specified.

Current catalog information.—Holotype: MSNM Am 284 (juvenile, SVL = 17.3 mm).

Remarks.—Scortecci (1943) described *Hyperolius zavattarii* (Fig. 3A,C) based on what he characterized as an adult female specimen from the wells of Gondaraba. Largen (1998; see also Largen, 2001b) recognized this specimen as immature and considered this taxon to be a junior synonym of *Hyperolius balfouri*. Scortecci (1943) noted that additional specimens (though not type specimens) from Lake Margherita were housed in the mission of the Istituto di Idrobiologia di Roma. The herpetological collections of the Laboratorio Centrale di Idrobiologia were transferred to the Museo Civico di Zoologia di Roma in 2009, but these specimens mentioned by Scortecci (1943) are not detailed in a recent study of the amphibians

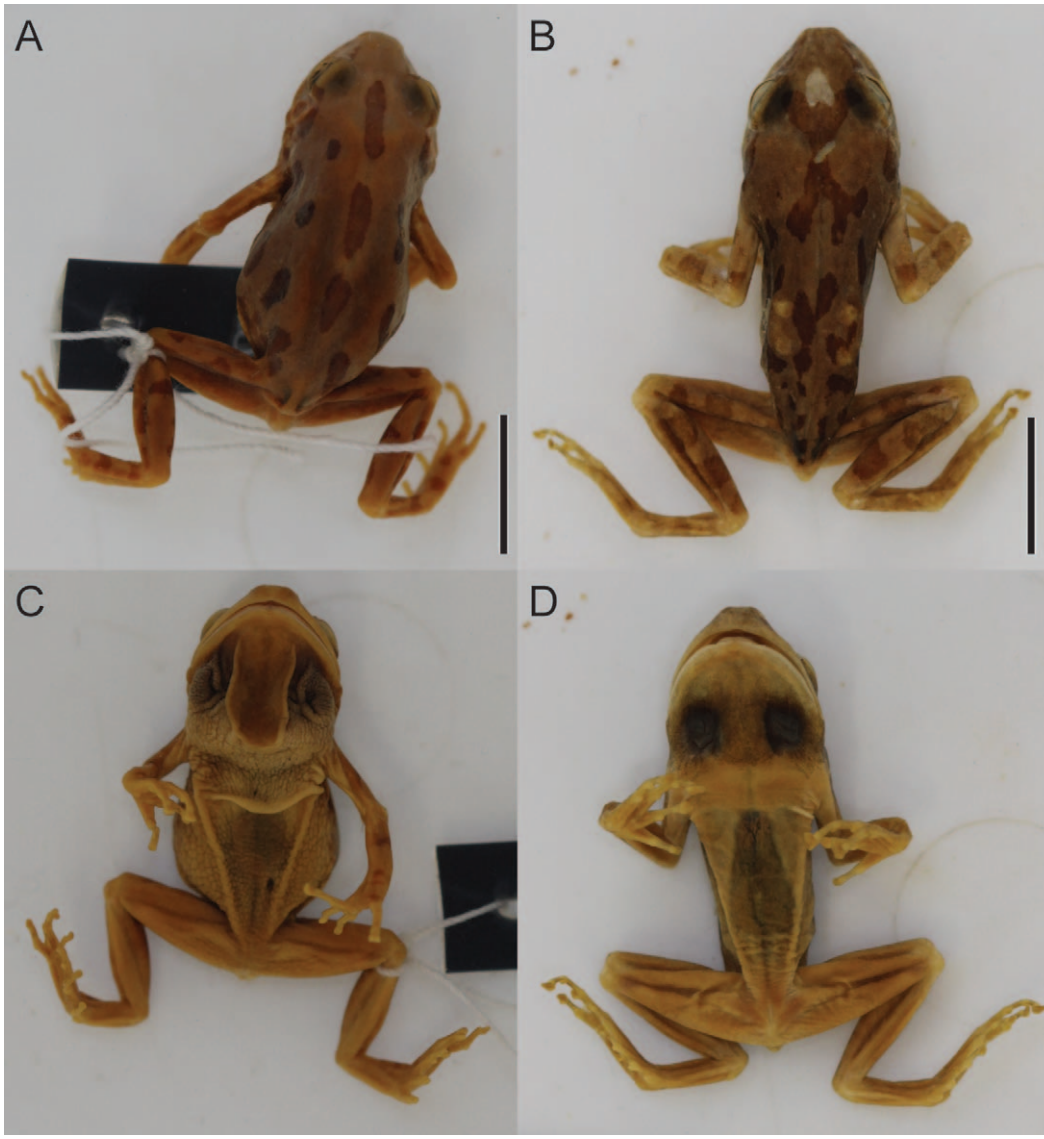

FIG. 4.—*Kassina somalica* Scortecci, 1932b (A,C; MSNM AM 8, holotype), *Megalixalus parkeri* Scortecci, 1932b (B,D; MSNM Am 6, lectotype). Scale bars = 10 mm.

in that collection (Capula et al., 2011). Scali (2010) did not list this taxon among the MSNM amphibian types.

Kassina somalica *Scortecci, 1932b*

Current taxonomy.—*Kassina somalica* Scortecci, 1932b.

Original publication information.—"1 ♂. Villaggio Duca degli Abruzzi [Jowhar, Somalia; 2.780868 45.500484]. Ottobre 1930" (Scortecci, 1932b); SVL given as 30 mm by Scortecci (1932b), and specimen number given as "N. 672" by Scortecci (1933).

Current catalog information.—Holotype: MSNM Am 8 (ex. 672; male, SVL = 29.0 mm).

Remarks.—Scortecci (1932b) described *Kassina somalica* (Fig. 4A,C) based on a single male specimen. Scortecci (1932b)

stated that this taxon was similar to "*K. senegalensis*, *deserticola* e *maculata.*" Gans et al. (1965) treated this as a subspecies of *K. senegalensis*. Subsequently, Schiøtz (1975) recognized this taxon as a junior synonym of *Kassina senegalensis* and corresponding to his "Form 2" of *K. senegalensis*; Drewes and Roth (1981) followed this by recognizing it as a subspecies of *K. senegalensis*. Lanza (1981) treated *K. somalica* as valid and removed it from synonymy with *K. senegalensis*; both Lanza (1990) and Largen (2001b) followed this decision. However, Largen (2001b) also pointed out that the distinction of *K. somalica* from *K. senegalensis* is still a point requiring further research. Doria et al. (2001–2002) cite additional specimens, including ones from the oasis of Galgalò collected by Scortecci during a later trip to Somalia in 1953.

Megalixalus parkeri *Scortecci, 1932b*

Current taxonomy.—Kassina maculifer (Ahl, 1924).

Original publication information.—"1 ♂. 1 ♀. Garoe Somalia [Garowe, Puntland State of Somalia; 8.405364 48.484465]. 29 Giugno 1931" (Scortecci, 1932b); specimen number for both specimens given as "N. 673" by Scortecci (1933); Frost (1985) lists the type specimen as MSNM [MSNM] 673.6.

Current catalog information.—MSNM Am 6 (ex. 673; lectotype; male, SVL = 33.4 mm), 7 (ex. 673; paralectotype; female, SVL = 30.6 mm).

Remarks.—Megalixalus parkeri (Fig. 4B,D) has a long history of being considered either as a valid taxon or as a synonym of *Kassina maculifer*. Indeed, even in the description of this taxon, Scortecci (1932b) commented that it was similar to "*M. maculifer* Ahl." Balletto et al. (1978) designated the lectotype and paralectotype and discussed the distinction between this taxon and *K. somalica*. Many later authors have treated *K. parkeri* as valid (Lanza, 1981, 1990; Drewes, 1984, 1985; Tandy and Drewes, 1985). Schiøtz (1999) treated *K. parkeri* as a junior synonym of *K. maculifer*, citing "Largen (in litt.)" (see also Largen, 2001b). Doria et al. (2001–2002) cite additional specimens from Wadi Dhuudo collected by Scortecci during a later trip to Somalia in 1957.

Rappia rossii *Calabresi, 1925*

Current taxonomy.—Hyperolius viridiflavus (Duméril and Bibron, 1841).

Original publication information.—"Venne radunato dal Dott. Aurelio Rossi…nell'agosto del 1924…l ♂ e 1 ♀ (No. 584)" "Regione dell'Alto Uellè (Congo Belga)" [Region of the Upper Uele River, Orientale Province, Democratic Republic of Congo; unspecified locality], SVL = 30 mm (though it is unclear to which specimen this measurement refers; Calabresi, 1925).

Current catalog information.—Two syntypes: MSNM Am 471 (ex. 584; male, SVL = 25.7 mm; figured in Calabresi, 1925), 472 (ex. 584; female, SVL = 29.5 mm).

Remarks.—Calabresi (1925) described *Rappia rossii* (Fig. 3B,D) based on two specimens collected from the Upper Uele River at an unspecified locality. However, based on maps provided in Rossi's (1931) travelogue, it seems likely that these specimens were collected from an area near or just east of present-day Watsa (3.037162 S, 29.535509 E). Loveridge (1936b) attributed specimens from western Kenya to *Hyperolius rossii.* Laurent (1943) considered this taxon to be a junior synonym of *Hyperolius burgeoni* DeWitte 1921, which he later (Laurent, 1951, 1952) considered a junior synonym of *Hyperolius viridiflavus pachydermus* (Werner, 1908). Both syntypes are still present in the MSNM.

Microhylidae Günther, 1858

Fichteria somalica *Scortecci, 1941*

Current taxonomy.—Phrynomantis somalicus (Scortecci, 1941).

Original publication information.—"Dintorni del Villaggio Duca degli Abruzzi (Somalia) [Jowhar, Somalia; 2.780868 45.500484], U. Fiechter l. 1930 – 1 ♀[.] Basso Giuba [Lower Juba, Somalia; unspecified locality], Marchese S. Patrizi l. Settembre 1923 1 es." (Scortecci, 1941); specimen numbers not provided.

Current catalog information.—One syntype: MSNM Am 1326 (female; SVL = 41.0 mm).

Remarks.—Scortecci (1941) described *Fichteria somalica* (Fig. 5A,D) based on two specimens, one of which he identified as being in a poor-enough state of preservation to make identification difficult. Only one of these appears to remain in MSNM. Gans et al.

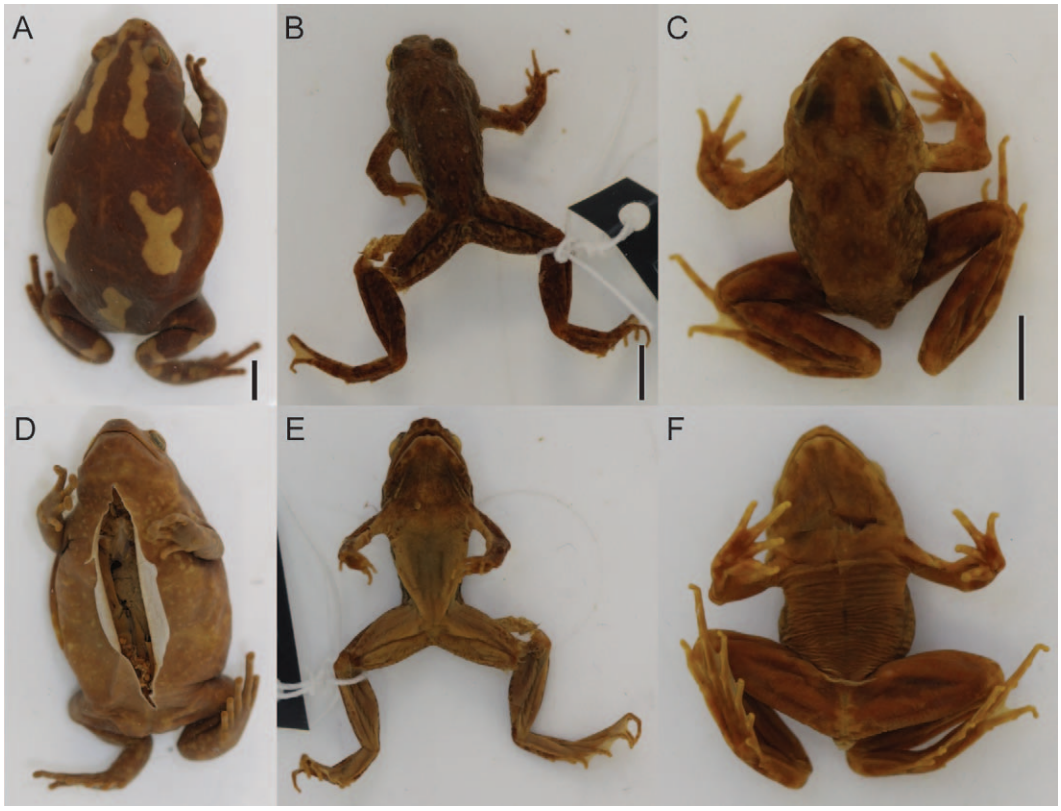

FIG. 5.—*Fichteria somalica* Scortecci, 1941 (A,D; MSNM Am 1326, syntype), *Arthroleptis–Phrynobatrachus sciangallarum* Scortecci, 1943 (B,E; MSNM Am 229, holotype), *Arthroleptis–Phrynobatrachus zavattarii* Scortecci, 1943 (C,F; MSNM Am 1329, syntype). Scale bars = 5 mm.

(1965) considered this taxon morphologically similar to *Phrynomantis bifasciatus* but that its unique color pattern warranted recognition as a distinct subspecies (*P. bifasciatus somalicus*). Without comment, Lanza (1990) recognized *Phrynomantis somalicus* as distinct from *P. bifasciatus*. Based on a single specimen (BM 1976.684), Largen (2001b) identified this species as also present in southern Ethiopia. Only one syntype was found in the MSNM collection.

Phrynobatrachidae Laurent, 1941

Arthroleptis–Phrynobatrachus sciangallarum *Scortecci, 1943*

Current taxonomy.—*Phrynobatrachus natalensis* (Smith, 1849).

Original publication information.—"Murlè [Murle, Ethiopia; 5.15 36.216667]. 19 luglio 1939. 1 ♂", SVL given as 22 mm (Scortecci, 1943); specimen number not provided.

Current catalog information.—Holotype: MSNM Am 229 (?male, SVL 20.7 mm).

Remarks.—Following lengthy discussion of the state of confusion regarding morphology of *Arthroleptis* and *Phrynobatrachus*, Scortecci (1943) opted to use "*Arthroleptis–Phrynobatrachus*" for three species, including two new species. Largen (2001a) discusses reasons for considering *Arthroleptis–Phrynobatrachus sciangallarum* (Fig. 5B,E) to be a junior synonym of *Phrynobatrachus natalensis*. This taxon was not listed among the MSNM amphibian types by Scali (2010).

Arthroleptis–Phrynobatrachus zavattarii *Scortecci, 1943*

Current taxonomy.—*Phrynobatrachus natalensis* (Smith, 1849).

Original publication information.—"Caschei [locality unclear; Largen (2001a) locates this "on

the Turmi River" and thus in the Southern Nations, Nationalities, and People's Region of Ethiopia]. 30 giugno: 8 e 18 luglio 1949. 4 es.", SVL given as 19.5, 19, 18, and 16.5 mm (Scortecci, 1943); neither sex nor specimen numbers provided.

Current catalog information.—Four syntypes (sex unknown): MSNM Am 606A (SVL = 17.5 mm), 606B (SVL = 18.1 mm), 1329 (SVL = 18.9 mm), and 1446 (SVL = 15.9 mm).

Remarks.—Largen (2001a) discusses reasons for considering *Arthroleptis–Phrynobatrachus zavattarii* (Fig. 5D,F) to be a junior synonym of *Phrynobatrachus natalensis*. Scali (2010) lists a paratype as present, but in fact the MSNM retains all four specimens and, to our knowledge, no specimens have been designated as a lectotype or paralectotypes. For discussion of Scortecci's (1943) use of a hyphenated generic name, see above.

Ptychadenidae Dubois, 1987

Rana cornii *Scortecci, 1929*

Current taxonomy.—*Ptychadena tellinii* (Peracca, 1904).

Original publication information.—"(No. 593) 2 es. (A, B). Adamó [possibly Adamo, Gasha-Barka Region, Eritrea; 14.436766 37.206896] – Missione Corni, Calciati, Bracciani *l. d.* [.] (No. 594) 2 es. Pozzi di Giarabà [possibly Giaraba, Gasha-Barka Region, Eritrea; 14.494281 37.421018] – Missione Corni, Calciati, Bracciani *l. d.*" (Scortecci, 1929).

Current catalog information.—Two syntypes: MSNM Am 141 (sex unknown, SVL = 41.2 mm), 685 (ex. 594; juvenile, SVL = 28.1 mm).

Remarks.—Scortecci's (1929) description of *Rana cornii* was based largely on "Esemplare A," corresponding to MSNM Am 141 (Fig. 6A,C). Though the type series consisted of four specimens, descriptive information was only provided for the two specimens from Adamó. At present, three specimens remain; these include one tadpole that is not mentioned in the species description (and thus we do not consider it a type). Largen (1997) placed *Rana cornii* in the synonymy of *Ptychadena schubotzi* (Sternfeld, 1917), a taxon that Largen (2001b) later placed in the synonymy of *Ptychadena tellinii* (Peracca, 1904). Largen (1997) reported that one syntype specimen from Giarabà (example C from Scortecci, 1929) is located in the Natural History Museum of London (BM 1930.2.1.1). Citing a personal communication from J.-L. Perret, Frost (1985) stated that the type specimens of *Rana cornii* were "lost in World War II." Our survey reveals that at least three of the four syntypes still exist (two in MSNM and one in BM).

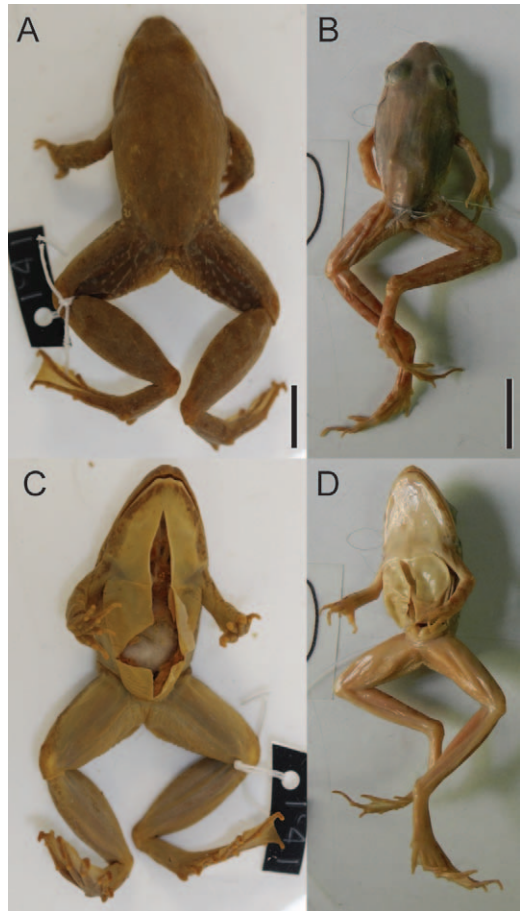

FIG. 6.—*Rana cornii* Scortecci, 1929 (A,C; MSNM Am 141, syntype), *Rana oxyrhynchus migiurtina* Scortecci, 1933 (B,D; MSNM Am 620, syntype). Scale bars = 10 mm.

Rana oxyrhynchus migiurtina *Scortecci, 1933*

Current taxonomy.—*Ptychadena anchietae* (Bocage, 1868).

Original publication information.—"N. 638 – 2 ♀, 7 juv. – Uadi Arro (Ahl Mascat –

Migiurtinia) [possibly Uadi Araro, Puntland State of Somalia; 11.312204 50.852275] 2–4 Settembre 1931. N. 639 – 5 ♂, 2 ♀ – Uadi Badulle (Ahl Mascat – Migiurtinia) [possibly Uadi Badle, Puntland State of Somalia; 11.117174 50.345486] 5 Settembre 1931" (Scortecci, 1933); note: no type specimens were specified (see below for discussion).

Current collection information.—Fifteen syntypes: MSNM Am 614 (ex. 639; five males, SVL = 31.6 mm, 33.2 mm, 34.5 mm, 34.6 mm, 35.9 mm; two females, SVL = 42.7 mm, 45.1 mm), 620 (ex. 638; five juveniles, SVL = 25.6 mm, 26.6 mm, 26.9 mm, 27.3 mm, 27.4 mm), 621 (ex. 638; two juveniles, SVL = 25.5 mm, 30.9 mm; one female, SVL = 39.9 mm).

Remarks.—Scortecci (1933) described the subspecies *Rana oxyrhynchus migiurtina* (Fig. 6B,D) based on specimens from the Migiurtinia region of Somalia. He described this subspecies in a lengthy description on *Rana oxyrhynchus* and, unfortunately, did not make explicit which specimens represented the type series. In explaining the environment in which this subspecies is found, Scortecci (1933) makes reference to "Nella Migiurtinia e particolarmente nei monti dell'Ahl Mascat ed in tutta la valle che li separa dall'Ahl Medoh." As Scortecci (1933) lists both Uadi Arro and Uadi Badulle as being in Ahl Mascat, the type series would probably best be considered corresponding to the two lots numbered 638 and 639 in his paper. Because it was collected in Migiurtinia, it is possible that the single female specimen reported from "El Donfar (Migiurtinia)" should be included among the types, but we do not recognize it here as Scortecci specifically referenced "Ahl Mascat" in his description. Many of the specimens from Uadi Badulle (MSNM Am 614) and Uadi Arro (MSNM Am 620) still exist in the MSNM collections. Of the existing specimens, the one most closely resembling that figured by Scortecci (1933) is shown in Figure 6 (B,D). Though Guibé and Lamotte (1960) did not examine the type specimens, which they presumed lost, they suggested that *Rana oxyrhynchus migiurtina* is a synonym of *Ptychadena anchietae*, which was followed by later authors such as Lanza (1981).

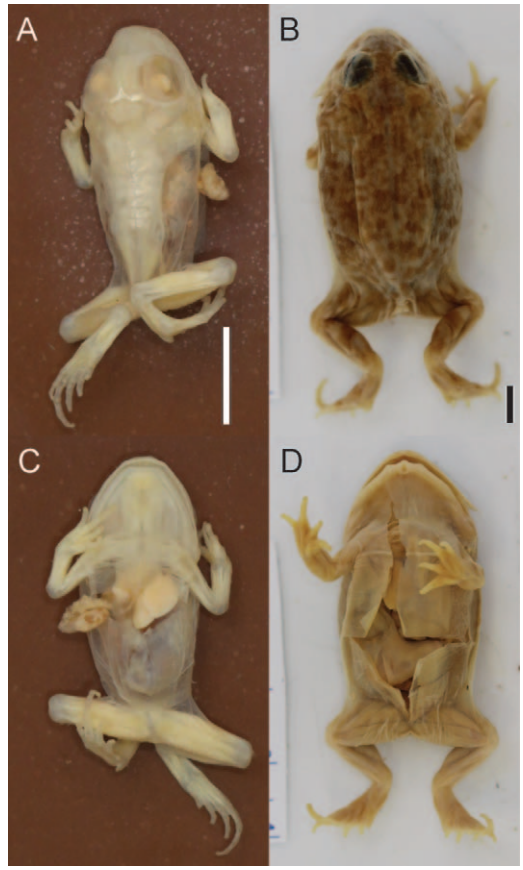

FIG. 7.—*Arthroleptis elegans* Calabresi, 1927 (A,C; MSNM Am 1328, paralectotype), *Rana* (*Pyxicephalus*) *cimmarutai* Calabresi, 1927 (B,D; MSNM Am 2, holotype). Scale bars = 5 mm.

Pyxicephalidae Bonaparte, 1850
Arthroleptis elegans *Calabresi, 1927*

Current taxonomy.—*Tomopterna elegans* (Calabresi, 1927).

Original publication information.—"Quattro esemplari raccolti nel pozzo di Hongolò (Uadi Hoor) [Hongolo, Puntland State of Somalia; 8.8947 50.2062]" (Calabresi, 1927); one individual listed with SVL of 19 mm; no specimen numbers provided.

Current catalog information.—One paralectotype: MSNM Am 1328 (ex. 585; juvenile, SVL = 13.6 mm).

Remarks.—Calabresi (1927) described *Arthroleptis elegans* (Fig. 7A,C) based on four specimens collected from a well at Hongolò in Uadi Hoor. Scortecci (1933) treated *Arthroleptis*

elegans as valid alongside his *Rana* (*Pyxicephalus*) *delalandei*. Lanza (1978) designated the lectotype (listed in Scali, 2010) and paralectotypes and pointed out that these represent "actually very young individuals of *Tomopterna* (*delalandei*) *cryptotis*" (Lanza 1978:239–240). Lanza (1978) also noted that the lectotype and two of the paralectotypes are in the Museo di Storia Naturale La Specola of the Università degli Studi di Firenze; the remaining paralectotype is in MSNM. Zimkus and Larson (2011) resurrected this taxon from synonymy with *T. cryptotis*. Though morphological comparisons are not presented, the association of type material with specimens used in the phylogenetic analysis of Zimkus and Larson (2011) is based on these coming from the same geographic region.

Rana (Pyxicephalus) cimmarutai *Scortecci, 1932a*

Current taxonomy.—*Pyxicephalus obbianus* Calabresi, 1927.

Original publication information.—"Un esemplare di Gardo (Migiurtinia) [Qardho, Puntland State of Somalia; 9.505062 49.084944], di 2 altri esemplari e di 7 larve provenienti da Las Aer a 90 Km. ad ovest di Obbia. L'essemplare di Gardo, che prendo come tipo…"; SVL for Gardo specimen given as 40 mm (Scortecci, 1932a); further collection data provided by Scortecci (1933) includes specimen numbers and collection dates: specimen from Gardo is "N. 645" collected on 20 August 1931, and others from Las Aer are "N. 646" collected 21 October 1930.

Current catalog information.—MSNM Am 2 (ex. 645; holotype; ?juvenile, SVL = 37.2 mm), 3 (ex. 646; paratype; ?juvenile, SVL = 31.2 mm), 4 (ex. 646; paratype; ?juvenile, SVL = 24.0 mm).

Remarks.—Scortecci (1932a) described *Rana* (*Pyxicephalus*) *cimmarutai* (Fig. 7B,D) based on one specimen from Gardo (considered as the type in that publication) and nine specimens from near Obbia (including seven tadpoles). Scortecci (1933) later provided a more thorough description of these specimens and recognized it as distinct from *Pyxicephalus obbianus*. Balletto et al. (1978) recognized *Rana* (*Pyxicephalus*) *cimmarutai* as a junior synonym of *Pyxicephalus obbianus*.

Ranidae Rafinesque, 1814

Rana fiechteri *Scortecci, 1929*

Current taxonomy.—*Hylarana galamensis* (Duméril and Bibron, 1841).

Original publication information.—"(No. 606) 1 ♂. Villaggio Duca degli Abruzzi [Jowhar, Somalia; 2.780868 45.500484]. 9 Dicembre 1928 – U. Fiechter *l. d.*" SVL = 50 mm (Scortecci, 1929).

Current catalog information.—Holotype: MSNM Am 1327 (ex. 606; SVL = 47.3 mm).

Remarks.—Loveridge (1936a) recognized *Rana fiechteri* (Fig. 8A,C), *Rana magretti* Scortecci, 1929, and *Rana somalica* Scortecci, 1930, as junior synonyms of *Rana* (now *Hylarana*) *galamensis bravanus* (Peters, 1882). However, Loveridge (1936a) pointed out that examination of the type specimen of *Rana fiechteri* was "worth checking before acceptance of [his] conclusion." Perret (1977) followed Loveridge (1936a), as did Lanza (1990). Largen (1997) mentions only *Rana magretti* as a junior synonym of *Hylarana galamensis*, and Largen (1997, 2001b) did not comment on either *Rana fiechteri* or *Rana somalica*.

Rana somalica *Scortecci, 1933*

Current taxonomy.—*Hylarana galamensis* (Duméril and Bibron, 1841).

Original publication information.—"N. 642 – 1 ♂, 2 juv. – Villaggio Duca degli Abruzzi [Jowhar, Somalia; 2.780868 45.500484], Febbraio 1930" (Scortecci, 1933); SVL given as 63 mm for male, and 27 and 37 mm for two juveniles (Scortecci, 1933).

Current catalog information.—One syntype: MSNM Am 623 (ex. 642; SVL not measurable because of specimen condition, see below).

Remarks.—Scortecci (1930) described *Rana somalica* based on three specimens (one female and two juveniles) collected by U. Fiechter in February 1930. Scortecci (1930) stated that this species "approaches" *Rana fiechteri*, which he earlier described from the same locality (Scortecci 1929). MSNM Am 623 is a disarticulated skeleton with associated pieces of skin in alcohol. It seems to represent the single larger individual cited in Scortecci (1933); there is no evidence of the two smaller specimens and these may have been lost. Loveridge (1936a) considered this a junior

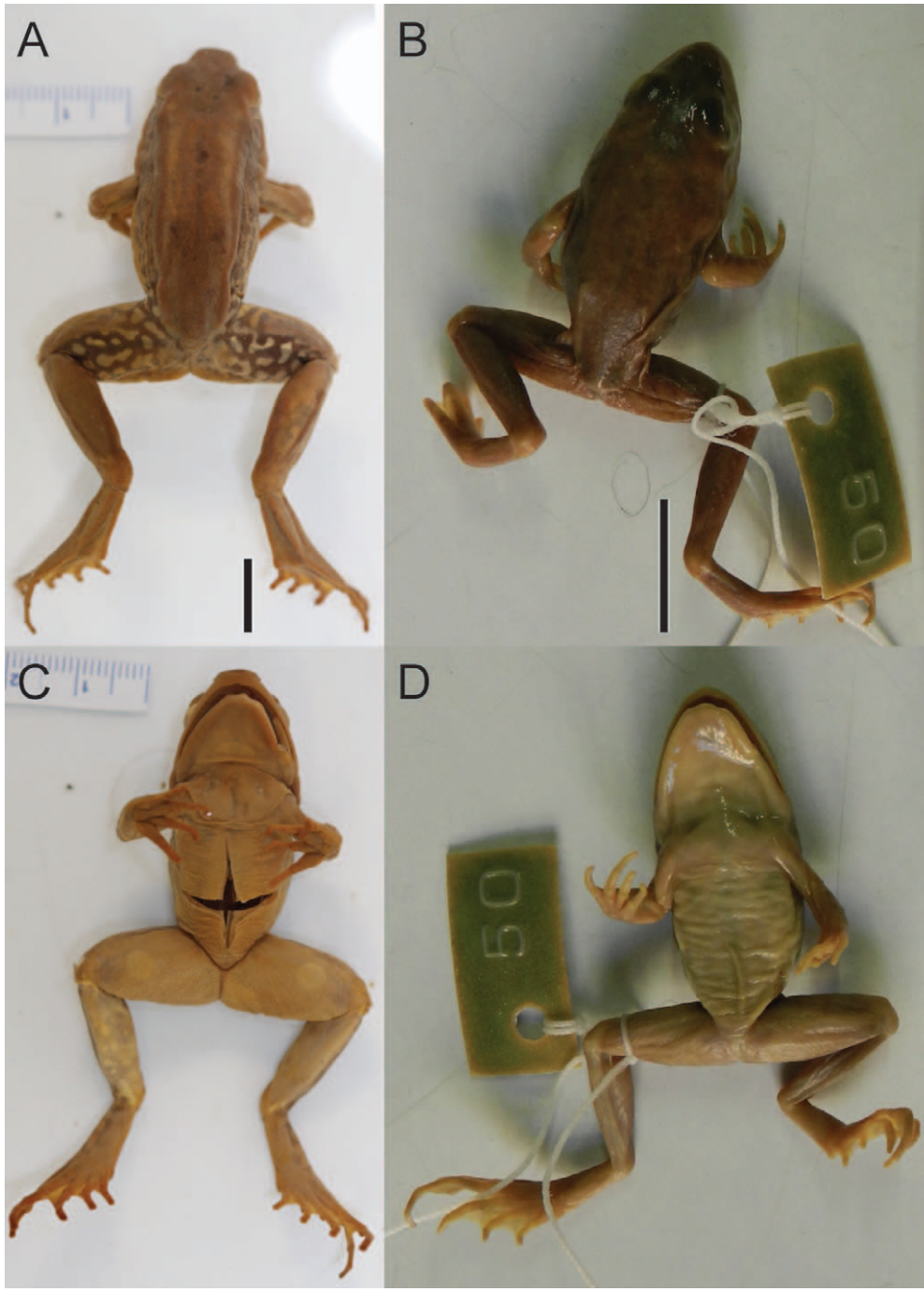

FIG. 8.—*Rana fiechteri* Scortecci, 1929 (A,C; MSNM Am 1327, holotype), *Rana zavattarii* Scortecci, 1936 (B,D; MSNM Am 50, syntype). Scale bars = 10 mm.

synonym of *Rana* (now *Hylarana*) *galamensis bravanus* (Peters, 1882).

Rana zavattarii *Scortecci, 1936*

Current taxonomy.—*Pelophylax saharicus* (Boulenger in Hartert, 1913).

Original publication information.—"…Dell'oasi di Elbarkat [Al Barkat, Libya; 24.888125 10.182946]…1 es. juv. 2 Marzo 1934. G. Scortecci l. 2 es. ad. Estate 1934. Cav. G. Garganese l. 7 larve. Estate 1934. Cav. G. Garganese l"; SVL of adult and juvenile specimens given as 49, 42, and 30 mm SVL (Scortecci 1936).

Current catalog information.—Seven syntypes: MSNM Am 50 (syntype; juvenile; SVL = 28.5 mm), 261 (former collection number unknown; lot of five tadpoles), 1445 (ex. 80; sex unknown, SVL = 47.8 mm).

Remarks.—Dubois and Ohler (1996) reported that the type specimens of *Rana zavattarii* Scortecci 1936 could no longer be found. During the course of this study, using a combination of collections data and measurement data, we identified the likely syntypes of this species in the MSNM collection (Fig. 8B,D). The MSNM specimens matching the original publication data correspond to one juvenile specimen collected by Scortecci, a series of five tadpoles, and possibly one adult specimen collected by Garganese. This suggests that two of the tadpoles and one of the adults collected by Garganese have been lost. Both Eiselt and Schmidtler (1973) and Dubois and Ohler (1996) suggested this taxon to be junior synonym of what is today recognized as *Pelophylax saharicus* (Boulenger in Hartert, 1913), and our examination of these syntypes confirms this. This is the southernmost locality for *Pelophylax saharicus* in Libya. Dumont (1987) reported its presence at Al Barkat, but more recent surveys by Frynta et al. (2000) and Ibrahim (2008) did not.

Caudata Fischer von Waldheim, 1813
Plethodontidae Gray, 1850
Hydromantes italicus bonzanoi *Bruno and Bologna, 1973*

Current taxonomy.—*Hydromantes* (*Speleomantes*) *strinatii* Aellen, 1958.

Original publication information.—"*Località tipica*. Grotta detta <<Tana Ia du Casà>> (537 Li); 4°30′27″ e 44°00′12″; I.G.M.: F 91, Q II, S.E., Pieve di Teco. Situata sul versante Sud del Colle San Bartolomeo nell'alta Valle del torrente Impero, nel comune di Caravonica, in provincia di Imperia, a m 712 s.l.m. *Olotipo*. ♂, n. 1271 M[arco] B[ologna]…proveniente dalla località tipica e catturato il 10-X-1971 dal dr. C. Bonzano. Ora nella collezione erpetologica del Museo Civico di Storia Naturale di Milano. *Allotipo*. ♀, n. 1273 MB, proveniente dalla località tipica e catturato il 10-X-1971 dal dr. C. Bonzano. Ora nella collezione erpetologica del Museo Civico di Storia Naturale di Milano" (Bruno and Bologna, 1973).

Current catalog information.—MSNM Am 1325 (1271 MB; holotype; male, SVL = 51.9 mm), 1325 (1273 MB; allotype; female, SVL = 56.6 mm).

Remarks.—Bruno and Bologna (1973) differentiated *Hydromantes italicus bonzanoi* (Fig. 9) from other related subspecies by relative differences in the lengths of the hind foot and head. Bruno (1973) followed Bruno and Bologna (1973) by recognizing *H. italicus bonzanoi* as one of seven subspecies of *H. italicus* (*strinatii*, *bonzanoi*, *argentatus*, *ligusticus*, *ambrosii*, *gormani*, *italicus*). Nascetti et al. (1996) refined the taxonomy related to *H. italicus* and *H. ambrosii* and recognized *H. strinatii* as distinct from *H. ambrosii*. Because that analysis included samples from type localities of *ligusticus*, *argentatus*, *bonzanoi*, and *strinatii*, the authors argued that these all represented a single species, *H. strinatii*; this was followed by Lanza et al. (2005, 2007) and Forti et al. (1997). Raffaëlli (2007) did not recognize subspecies of *Hydromantes* (*Speleomantes*) *strinatii* (i.e., *Hydromantes italicus argentatus*, *Hydromantes italicus ligusticus*, or *Hydromantes italicus bonzanoi*) but did retain *italicus* as a "type" of *H. strinatii*. Carranza et al. (2008) included specimens from the region of the type locality of *H. italicus bonzanoi* (ca. Imperia, Liguria) but did not comment on previously proposed subspecific taxonomy related to *H. strinatii*.

Amphibian Taxa for Which All Type Specimens May Be Lost

The type specimens of three taxa described by Giuseppe Scortecci are absent from the

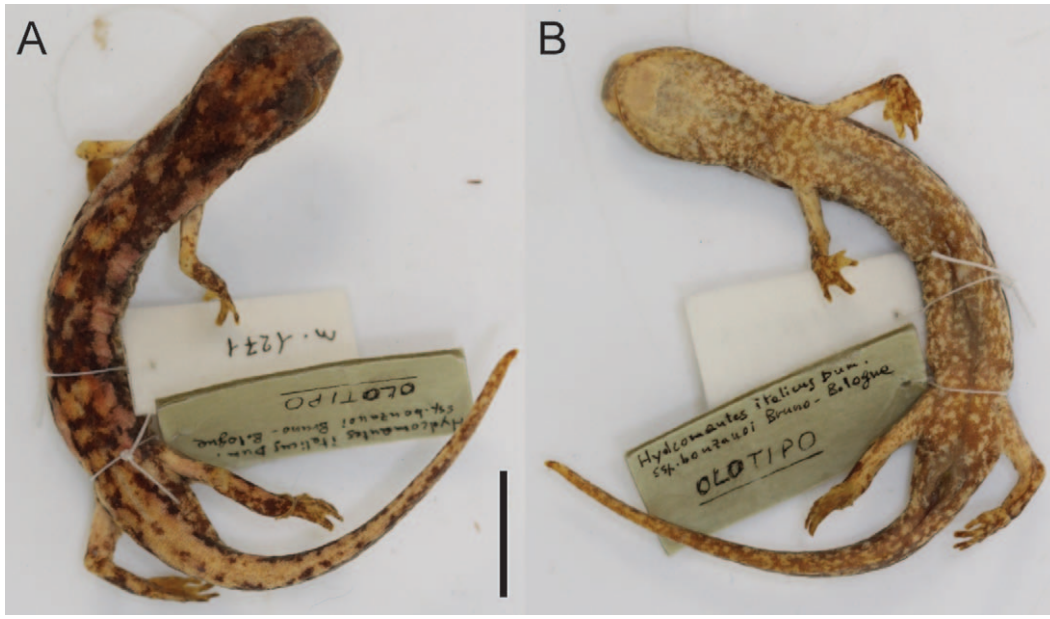

FIG. 9.—*Hydromantes italicus bonzanoi* (A,B; MSNM Am 1325, holotype). Scale bar = 10 mm.

MSNM collections: *Rana demarchii* Scortecci, 1929, *Rana magretti* Scortecci, 1929, and *Hyperolius destefanii* Scortecci, 1943. Types of other taxa described in these same publications are present in MSNM. Other specimens collected by Dr. P. Magretti and cited in Scortecci (1929) are still in the MSNM collections, but the type specimens of *Rana magretti* or other amphibian specimens from Ghinda from the 1920s or before could not be located. The original publication data for *Rana demarchii* list one male and one female from Eritrea collected by Dr. G. Ferri, though no amphibian specimens from Eritrea collected by Ferri are currently known to reside in MSNM; see Largen (1997) and Largen and Spawls (2010) for further discussion of this enigmatic taxon. *Hyperolius destefanii* was described based on a single male specimen from Nargi (Scortecci, 1943), but neither this specimen nor any other amphibian from this locality can be located at MSNM. Further, neither these three taxa nor specimens with similar collection data are included in the list of specimens present in the collections in Genoa by Doria et al. (2001–2002), nor are they obviously in other Italian collections (Mazzotti, 2010). At present, we consider these specimens lost.

Specimens of three taxa described in the 19th Century have been previously stated as having originally been at MSNM but are now lost (Frost, 1985, 2013). Based on Conci (1967), Frost (1985) cited the type specimens of *Phryniscus ignescens* Cornalia 1849 (now *Atelopus ignescens*) as lost; see also Lötters (1996) and Coloma et al. (2000). The English summary provided at the end of Conci's (1967) work on Jan's life and work states "Nearly all the collections that belonged to the Milan Museum in the period covered by this work were completely destroyed in 1943 as a result of fire caused by air bombardment." In the account of *Atelopus ignescens* (Cornalia, 1849) in the first edition of *Amphibian Species of the World*, Frost (1985) states "Formerly MSNM, but now lost, according to Conci, 1967." In later versions of *Amphibian Species of the World*, this extrapolation from Conci's English summary was extended to other taxa for which type specimens were believed to be in Milan (e.g., Frost, 2013). In fact, of the Milan herpetological collections, Conci (1967) only references "Jan's collection of snakes" as lost, and no other specific details were provided. Examination of the 1853 handwritten catalog in the MSNM archives reveals the presence of two specimens of "*Phryniscus*

ignescens" numbered 231 and 232. These specimens were presumably the type specimens and there is no evidence of them today in the MSNM collections; we assume them lost. Similarly, *Pelobates insubricus* Cornalia, 1873 (now *Pelobates fuscus;* Laurenti, 1768), is stated by Frost (2013) to have been "presumably originally in MSNM." The MSNM catalogs indicate that in 1873 several specimens (including one male and one female) from "Mirasole" (a town near Milan) were catalogued as *Pelobates fuscus*. These specimens may represent the types, but because we could not locate them during our study we assume that they too are lost. Finally, Frost (2013) states that types of *Hyla phrynoderma* Boulenger, 1889 (now *Scinax acuminatus*; Cope, 1862) are at MSNM. However, neither Boulenger (1889) nor Condit's (1964) later work on hylid frogs in the British Museum, nor the MSNM catalog, provide any support that these specimens were ever deposited at MSNM, the Museo Civico di Storia Naturale "G. Doria" di Genova (Doria et al. 2001–2002), or the Museo di Storia Naturale dell'Università di Firenze (La Specola; Nistri, 2010).

The 19th Century Collections and Jan's Nomina Nuda

Previous workers have suggested that the entirety of the herpetological collections of Giorgio Jan used in publications such as Jan's (1857) *Cenni sul Museo Civico di Milano ed Indice sistematico dei rettili ed anfibi esposti nel medesimo* or Jan and Sordelli's (1860–1866) *Iconographie Générale des Ophidiens* was destroyed or lost. Also presumed lost are specimens used by other 19th Century authors, especially Cornalia (1849, 1873; see above). The principal reason for this loss is the destruction of large portions of the Museo Civico di Storia Naturale during Allied bombings in August 1943 (Parisi, 1944; Conci, 1967; Frost, 1985; Barbagli, 2010; Scali, 2010). Parisi (1944) figured the destroyed hall of reptiles where most of the Jan collections are believed to have resided and noted that most of the herpetological collections were relatively recent (i.e., early–mid 20th Century). These remaining collections, including the important Italian colonial collections made by Scortecci, Cipriani, Moltoni, Zavattari, Patrizi, Puccioni, and others were left largely, if not entirely, intact.

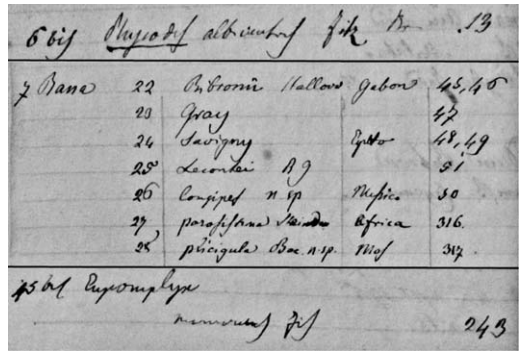

FIG. 10.—Excerpts from unpublished 1853 catalog showing records for *Physodes albiventris* (top), several species of *Rana* including *Rana Savignyi* (middle), and *Eupomplyx marmoratus* (bottom).

During the course of our survey of the amphibian collection, several specimens from Jan's 19th Century collection were discovered. In most cases, these specimen jars contained a numeric code either on the jar or on paper within the jar. We were able to match these numbers to those added to the handwritten 1853 catalog in the MSNM archives, presumably in the late 19th Century. All of these names appear on the left-hand side of the catalog rather than the right side, which contains the bulk of the names featured in Jan (1857). Curiously, these names appear alongside others that the second, undated catalog demonstrates only entered the MSNM collection after Jan's (1857) publication in the later 19th Century, and both the names that are nomina nuda in Jan's (1857) catalog and those added to the collection later appear to be written by the same person and possibly at the same time (Fig. 10). This indicates that these nomina nuda were likely added to the 1853 catalog after Jan's (1857) catalog and suggests that their original inclusion in that publication might not have been originally intended. Because several of these taxa are nomina nuda, including one genus, we provide details and figure the relevant specimens. These nomina nuda were likely based on "shelf names" using names sent from workers at other institutions. For further details on Jan's nomina nuda, see Frost (2013).

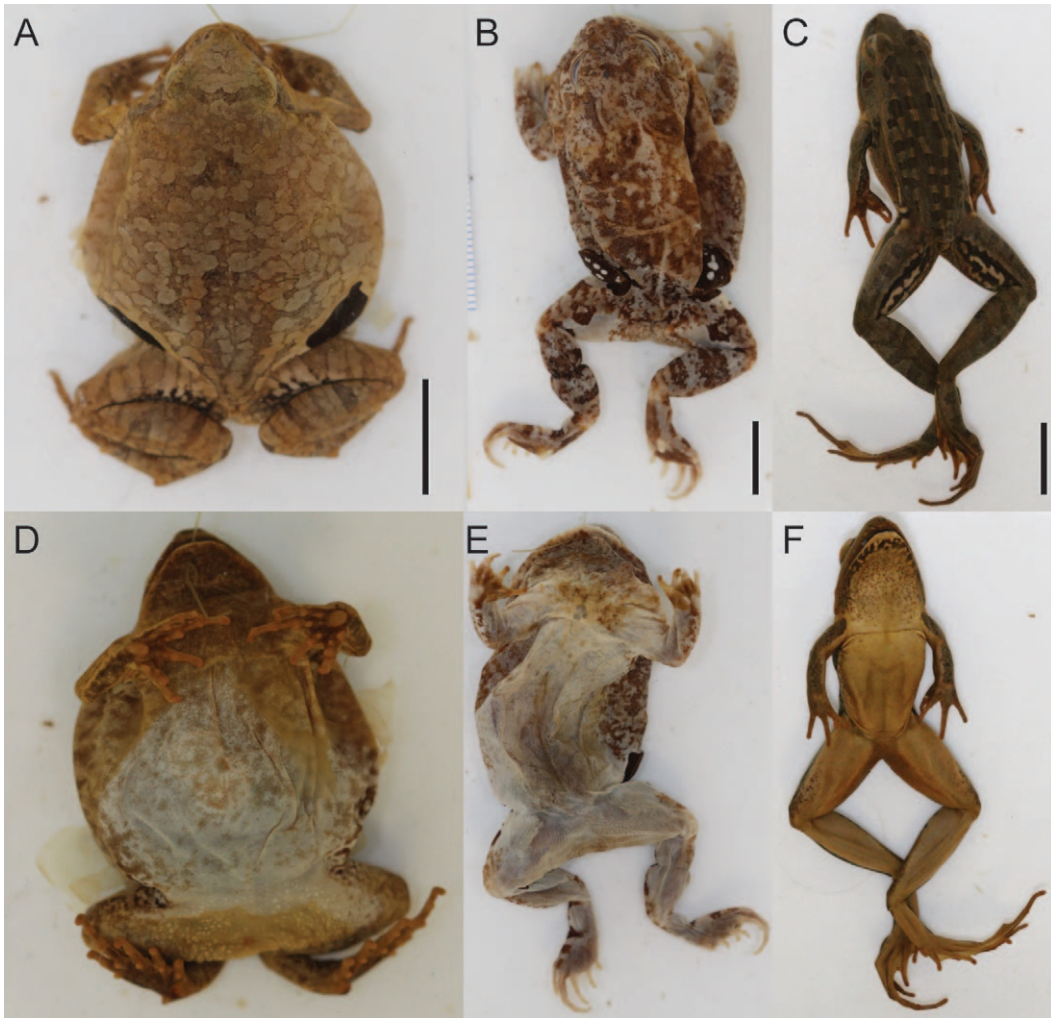

FIG. 11.—Specimens corresponding to nomina nuda from Jan's (1857) catalog. *Eupomplyx marmoratus* Jan, 1857 (A,D; MSNM Am 858), *Physodes albiventris* Jan, 1857 (B,E; MSNM Am 859), *Rana Savignyi* Jan, 1857 (C,F; one of four specimens in lot MSNM Am 739). Scale bars = 10 mm.

Leptodactylidae Werner, 1896
Eupomplyx marmoratus *Jan, 1857*

Current taxonomy.—*Eupemphix nattereri* Steindachner, 1863.

Current catalog information.—MSNM Am 858 (ex. 243; ?female, SVL = 32.8 mm).

Remarks.—Jan (1857) attributes both *Eupomplyx* and *E. marmoratus* (Fig. 11A,D) to "Fitz. Tsch." and listed this taxon as occurring in "Brasile." In the 1853 notebook, this taxon name (Fig. 10) is annotated with "Fi[?]"; a later catalog indicates the locality of this specimen as "Brasile." Steindachner (1864) listed "*Eupemphix marmoratus* Fitz. Tschudi, Mus. Vindob. Milan" as a synonym of *Eupemphix nattereri*, which he had described the previous year. Given that the likely authority noted in the 1853 catalog represents Leopold Fitzinger of the Naturhistorisches Museum Wien, it is plausible that the "shelf name" of a specimen sent to Jan by Fitzinger was later published by Jan as a nomen nudum in 1857, but then described in 1863 by Steindachner (who

worked with the same collection in Wien) using the name *Eupemphix nattereri*. The type material of *Eupemphix naterreri* (as well as *Pleurodema elegans* Steindachner 1863; see below) was collected by Natterer in Brazil and arrived in Wien in 1836. While correspondence documenting exchanges between Wien and Milan is not available in either institution, the number of individuals received from Natterer is clearly larger than the number of specimens later used by Steindachner in his species descriptions and, thus, suggests that some material may have been sent to other institutions (H. Grillitsch, personal communication).

Physodes albiventris *Jan, 1857*

Current taxonomy.—Pleurodema brachyops (Cope, 1869).

Current catalog information.—MSNM Am 859 (ex. 13; male, SVL = 43.3 mm).

Remarks.—Jan (1857) attributes both *Physodes* and *P. albiventris* (Fig. 11B,E) to "Fitz. Tsch." and listed this taxon as occurring in "Brasile." In the 1853 notebook, this taxon name (Fig. 10) is annotated with "Fitz." and "Br." *Physodes* has been considered as a genus of unknown affinity (Frost, 2013). As above, this was likely a "shelf name" of a specimen sent by Fitzinger to Jan. The specimen in the MSNM collections that is labeled with the name *Physodes albiventris* is most likely a species of the leptodactylid frog *Pleurodema*. Based on morphological data presented by Maciel and Nunes (2010), MSNM Am 859 most closely resembles *Pleurodema brachyops* and differs from other *Pleurodema* species found in Brazil. *Pleurodema elegans* Steindachner, 1863, is a synonym of *P. brachyops* and, as for *Eumpemphix naterreri* above, was described based on specimens collected by Naterrer in Brazil that arrived in the Naturhistorisches Museum Wien in 1836 (H. Grillitsch, personal communicatuon). While the locality data for *Physodes albiventris* is given as only "Brasile" by Jan, if these specimens were exchanged from Wien and represent part of the original series used to described *Pleurodema elegans*, then it is likely that the specimen in Milan was collected in what is now the state of Roraima in northern Brazil.

Ptychadenidae Dubois, 1987
Rana Savignyi *Jan, 1857*

Current taxonomy.—Ptychadena nilotica (Seetzen, 1855).

Current catalog information.—MSNM Am 739 (ex. 48; four specimens: male, SVL = 34.4 mm; female, SVL = 36.0 mm; metamorph, SVL = 20.4 mm, total length = 47.0 mm; tadpole, total length = 56.0 mm), 740 (ex. 49; two specimens: male, SVL = 37.1 mm; ?female, SVL = 36.5 mm).

Remarks.—Jan (1857) used *Rana Savignyi* (Fig. 11C,F) without attribution and listed it as occurring in "Egitto." Presumably the species name derives from Marie Jules César Savigny (b. 1777, d. 1851) who was part of the French scientific expedition accompanying Napoléon Bonaparte to Egypt in 1798 and later contributed to the *Déscription de l'Égypte*. Boulenger (1879) recognized that the specimens figured in 1809 by Audouin and Savigny in *Descrption de l'Égypte* corresponded to Jan's *Rana Savignyi* and thus considered this to be a synonym of what has long been recognized as *Ptychadena mascareniensis.* Similar to above, this name appears listed on the left side of the 1853 notebook where it is recorded as "*Savigny*" rather than "*Savignyi*" (Fig. 10), suggesting that it might not have been intended as a patronym but was an error in transcribing the notebook to print. Dehling and Sinsch (2013) recently recognized populations from Egypt, Rwanda, Uganda, and Kenya as both conspecific and different from *Ptychadena mascareniensis* and, thus, resurrected *Ptychadena nilotica*.

Other 19th Century Specimens of Interest

During our survey, we located three additional taxa mentioned by Jan (1857). Based on identification, locality information, and specimen numbers we believe the specimens at MSNM to be the same as those used by Jan. As MSNM specimens for two of these species appear to have been sent by Duméril to Jan (see Jan, 1857), it is plausible that these specimens are from among the type series of those species. These taxa—*Rana Delalandii* Duméril and Bibron, 1841, *Rana fuscigula* Duméril and Bibron, 1841, and *Rana fasciata* Smith, 1849—were indicated by Jan (1857) as coming from "Capo" (i.e., the Cape of Good

Hope of South Africa). The specimens still extant in MSNM referred to these three taxa are as follows: *Rana Delalandii* (MSNM Am 785; ex. 53; male, SVL = 50.1 mm; female, SVL = 60.7 mm); *Rana fuscigula* (MSNM Am 676; ex. 52; ?female, SVL = 76.5 mm); *Rana fasciata* (MSNM Am 688; ex. 54; ?female, SVL = 48.7 mm). Frost (2013) lists *Rana Delalandii* as "presumed lost as not mentioned in MNHNP type list," but Guibé (1950) cites both this species and associated type specimens (MNHNP 4473 and 4474). However, the type specimens of both *Rana Delalandii* and *Rana fuscigula* are still in the MNHNP collections (A. Ohler, personal communication). The taxonomy of *Rana fasciata* Smith, 1849, now *Strongylopus fasciatus*, is complicated (for summary, see Frost, 1985). Both the 1853 and 1857 catalogs give the authority as Boie. As discussed by Dubois (1997), Boie (1832) referred to *Rana fasciata* Burchell (1824), but in fact Boie's usage refers to what is now recognized as *Strongylopus grayii* (Smith, 1849). Jan (1857) and the unpublished late-19th Century catalog lists the locality for *Rana fasciata* Boie as from "Capo" or "Capo B. Sp," which corresponds to the Cape of Good Hope in South Africa, the region from which the types of *Rana grayii* Smith, 1849, were collected. While the specimens of *Rana Delalandii* and *Rana fuscigula* likely were sent by Duméril, the origin of the specimen of *Rana fasciata* remains unclear.

Discussion

The primary goal of this work is to facilitate future research on the taxa included here. As additional research is carried out on the diversity and evolution of amphibians in both North Africa and the Horn of Africa, there will be a need for comparisons to type specimens, especially in cases where cryptic diversity is revealed in species with junior synonyms (e.g., Zimkus and Larson, 2011). Documenting the collection of type specimens of amphibian species still present in the Museo Civico di Storia Naturale in Milan is important to avoid designating neotypes when, in fact, these types still exist. Further, our survey reveals that at least some portion still exists of the MSNM's important 19th Century collection of amphibian and reptiles. In addition to those listed above, we located non-type specimens of frogs catalogued during the late 19th Century. While the origin of these other specimens remains unclear, several are indicated as originating from Angola, and appear to have been sent to MSNM from Lisbon by José Vincente Barboza du Bocage, which is significant given the loss of the zoology collections of the Museu Nacional de História Natural e da Ciência in Lisbon due to a fire in 1978 (Almaça and Neves, 1987). Clearly, not all of the 19th Century collections brought together at MSNM by Giorgio Jan were lost in the 1943 bombing of the museum by Allied forces (Conci, 1967; Scali, 2010), and a short, informal survey of the reptile collection reveals that some further 19th Century specimens of reptiles remain at MSNM. A thorough and detailed survey of the MSNM reptile collections is worthwhile and may reveal components of an important collection long thought lost.

Acknowledgments.—We thank G. Bardelli for his assistance with maintaining and organizing the Milan herpetological collections and for providing DCB with help during his visits. D. Taylor assisted with portions of this work during 2011. A. Ohler assisted with verifying information in the MNHNP collections, and H. Grillitsch kindly provided details on the Naterrer collections in the Naturhistorisches Museum Wien. C. Corti and B. Lanza supplied copies of literature useful to this and ongoing work with Italian collections. M.G. Cuoghi, of the Istituto per lo Studio degli Ecosistemi (Consiglio Nazionale delle Richerche, Italy), provided details on the collections of the Instituto di Idrobiologia di Roma. We thank W. Duellman and I. Nunes for together providing suggestions for the identification of *Physodes albiventris*. Both A. Bauer and D. Frost provided valuable comments on drafts of this manuscript. The United States National Science Foundation (DEB 1019444 and 1202609) supported visits to the scientific research collections of the Museo Civico di Storia Naturale in Milan by DCB in 2011 and 2012.

Literature Cited

Aellen, V. 1958. Sur une nouvelle forme d'*Hydromantes* (Amphibia, Plethodontidae). Senckenbergiana Biologica 39:155–163.

Ahl, E. 1924. Über eine Froschsammlung aus Nordost-Afrika und Arabien. Mitteilungen aus dem Zoologischen Museum in Berlin 11:1–12.

Almaça, C., and A. Neves. 1987. The Museu Bocage and the new series of its Arquivos. Arquivos do Museu Bocage, Nova Série 1:1–8.

Balletto, E.M., M.A. Cherchi, and B. Lanza. 1978. On some amphibians collected by the late Prof. Giuseppe Scortecci in Somalia. Monitore Zoologico Italiano, Supplemento 11:221–243.

Barbagli, F. 2010. Il collezionismo erpetologico in Italia. Pp. 13–20 *In* S. Mazzotti (Ed.), Le Collezioni Erpetologiche dei Musei Italiani: Censimento e Analisi delle Collezioni di Anfibi e Rettili per la Loro Valorizzazione Scientifica. Museologia Scientifica Memorie, Number 5.

Blackburn, D.C., and D.B. Wake. 2011. Class Amphibia Gray, 1825. Pp. 39–55 *In* Zhang, Z.-Q. (Ed.), Animal Biodiversity: An Outline of Higher-level Classification and Survey of Taxonomic Richness. Zootaxa 3148.

Bocage, J.V.B. d. 1868 "1867". Batraciens nouveaux de l'Afrique occidentale (Loanda et Benguella). Proceedings of the Zoological Society of London 1867:843–846.

Boie, H. 1832. Briefe von Heinrich Boie; geschrieben aus Ostindien und der Reise dahin. Königlichen Taubstummen Institut, Germany.

Bonaparte, C.L.J.L. 1850. Conspectus Systematum. Herpetologiae et Amphibiologiae. Editio altera reformata. Lugdini Batavorum: E.J. Brill.

Boulenger, G.A. 1879. Synonymie de *Rana mascareniensis* D. et B. Bulletin de la Société Zoologique de France 4:92–94.

Boulenger, G.A. 1882. Catalogue of the Batrachia Salientia s. Ecaudata in the Collection of the British Museum, 2nd Ed. Taylor and Francis, UK.

Boulenger, G.A. 1889. On a collection of batrachians made by Prof. Charles Spegazzini at Colonia Resistencia, South Chaco, Argentine Republic. Annali del Museo Civico di Storia Naturale di Genova, Serie 2, 7:246–249.

Bruno, S. 1973. Anfibi d'Italia: Caudata. Natura (Milano) 64:209–450.

Bruno, S., and M. Bologna. 1973. L'*Hydromantes italicus* Dunn, 1923 nella Liguria occidentale e descrizione di una nuova sottospecie. Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano 114:81–92.

Burchell, W.J. 1824. Travels in the Interior of Southern Africa, Volume 2. Longman, Hurst, Rees, Orme, Brown & Greene, UK.

Calabresi, E. 1925. Anfibi e rettili raccolti dal Dott. Aurelio Rossi nella regione dell'Alto Uellè. Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano 64:119–125.

Calabresi, E. 1927. Anfibi e rettili raccolti nella Somalia dai Proff. G. Stefanini e N. Puccioni (Gennaio-Luglio 1924). Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano 66:14–60, 1 plate.

Capula, M., F. Contini, and A. Venchi. 2011. Catalogo delle collezioni erpetologiche del Museo civico di Zoologia di Roma. I. Amphibia. Annali del Museo civico di Storia naturale "G. Doria" 103:247–345.

Carranza, S., A. Romano, E.N. Arnold, and G. Sotgiu. 2008. Biogeography and evolution of European cave salamanders, *Hydromantes* (Urodela: Plethodontidae), inferred from mtDNA sequences. Journal of Biogeography 35:724–738.

Cherchi, M.A. 1958. Note su *Bufo gardoensis* Scortecci. Bollettino dei Musei di Zoologia e Anatomia comparata della R. Università di Genova 28:107–110.

Coloma, L.A., S. Lötters, and A.W. Salas. 2000. Taxonomy of the *Atelopus ignescens* complex (Anura: Bufonidae): designation of a neotype of *Atelopus ignescens* and recognition of *Atelopus exiguus*. Herpetologica 56: 303–324.

Conci, C. 1967. Il centenario di Giorgio Jan (1791–1866) e la fondazione ed il primo sviluppo del Museo Civico di Storia Naturale di Milano. Atti della Società Italiana di Scienze Naturale e del Museo Civico di Storia Naturale di Milano 106:5–94.

Condit, J.M. 1964. A list of the types of hylid frogs in the collection of the British Museum (Natural History). Journal of the Ohio Herpetological Society 4:85–98.

Cope, E.D. 1862. Catalogues of the reptiles obtained during the explorations of the Parana, Paraguay, Vermejo and Uraguay Rivers, by Capt. Thos. J. Page, U.S.N.; and of those procured by Lieut. N. Michler, U.S. Top. Eng., Commander of the expedition conducting the survey of the Atrato River. Proceedings of the Academy of Natural Sciences of Philadelphia 14:346–359.

Cope, E.D. 1869 "1868". Sixth contribution to the herpetology of tropical America. Proceedings of the Academy of Natural Sciences of Philadelphia 20: 305–312.

Cornalia, E.B.M. 1849. Vertebratorum Synopsis in Musaeo Mediolanense extantium quae per novum Orbem Cajetanas Osculati collegit Annis 1846–47–48. Speciebus novis vel minus cognitis adjectis, nec non Descriptionibus atque Iconibus illustratis [Mediolani]. Corbetta, Modoetia, Italy.

Cornalia, E.B.M. 1873. Observazioni sul *Pelobates fuscus* e sulla *Rana agilis* trovate in Lombardia. Atti della Societa Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano 16:97–107.

Dehling, J.M., and U. Sinsch. 2013. Diversity of ridged frogs (Anura: Ptychadenidae: *Ptychadena* spp.) in wetlands of the upper Nile in Rwanda: morphological, bioacoustic, and molecular evidence. Zoologischer Anzeiger 253:143–157.

Doria, G., S. Salvidio, and M.L. Tavano. 2001–2002. Catalogo degli anfibi del Museo Civico di Storia Naturale "G. Doria" di Genova. Annali del Museo Civico di Storia Naturale "Giacomo Doria" 94:21–247.

Drewes, R.C. 1984. A phylogenetic analysis of the Hyperoliidae (Anura): treefrogs of Africa, Madagascar, and the Seychelles Islands. Occasional Papers of the California Academy of Sciences 139:1–70.

Drewes, R.C. 1985. A case of paraphyly in the genus *Kassina* Girard, 1853 (Anura: Hyperoliidae). South African Journal of Science 81:186–191.

Drewes, R.C., and B. Roth. 1981. Snail-eating frogs from the Ethiopian highlands: a new anuran specialization. Zoological Journal of the Linnean Society 73:267–287.

Dubois, A. 1987 "1986". Miscellanea taxinomica batrachologica (I). Alytes 5:7–95.

Dubois, A. 1997. *Strongylopus* Tschudi, 1838 (Amphibia, Anura): proposed designation of *Rana fasciata* Smith, 1849 as the type species. Bulletin of Zoological Nomenclature 54:162–166.

Dubois, A., and A. Ohler. 1996 [dated 1994]. Frogs of the subgenus *Pelophylax* (Amphibia, Anura, genus *Rana*): a catalogue of available and valid scientific names, with comments on name-bearing types, complete synonymies, proposed common names, and maps showing all type localities. Zoologica Poloniae 39:139–204.

Duméril, A.M.C., and G. Bibron. 1841. Erpétologie Générale ou Histoire Naturelle Complète des Reptiles. Volume 8. Librarie Enclyclopedique de Roret, France.

Dumont, H.J. 1987. Sahara. Pp. 79–154 *In* M.J. Burgis and J.J. Symoens (Eds.), African Wetlands and Shallow Water Bodies. Éditions de l'ORSTOM, France.

Eiselt, J., and J.F. Schmidtler. 1973. Froschlurche aus dem Iran unter Berücksichtigung außeriranischer Populationsgruppen. Annalen des Naturhistorischen Museums in Wien 77:181–243.

Fischer von Waldheim, G. 1813. Zoognosia. Tabulis Synopticis Illustrata, in Usum Prælectionum Academiæ Imperialis Medico-Chirurgicæ Mosquensis Edita. Ed. 3. Volume 1. Nicolai Sergeidis Vsevolozsky, Russia.

Forti, G., R. Cimmaruta, G. Nascetti, B. Lanza, and L. Bullini. 1997. Glaciazioni del Quaternario e microevoluzione delle popolazioni continentali del genere *Hydromantes* (Amphibia, Plethodontidae). Biogeographia 19:197–211.

Frost, D.R. (Ed.). 1985. Amphibian Species of the World. Allen Press, and Association of Systematics Collections, USA.

Frost, D.R. 2013. Amphibian Species of the World: An Online Reference, Version 5.6. Available from http://research.amnh.org/herpetology/amphibia/index.html. American Museum of Natural History, New York, USA. Archived by WebSite at http://www.webcitation.org/6McuIzwzx on 14 January 2014.

Frynta, D., L. Kratochvíl, J. Moravec, P. Benda, R. Dandová, M. Kaftan, K. Klosová, P. Mikulová, P. Nová, and L. Schwarzová. 2000. Amphibians and reptiles recently recorded in Libya. Acta Societatis Zoologicae Bohemicae 64:17–26.

Gans, C., R.F. Laurent, and H. Pandit. 1965. Notes on a herpetological collection from the Somali Republic. Annales du Musée royal de l'Afrique central (série Zoologie) 8:1–93.

Gray, J.E. 1825. A synopsis of the genera of reptiles and Amphibia, with a description of some new species. Annals of Philosophy, Series 2, 10:193–217.

Guibé, J. 1950 [dated 1948]. Catalogue des Types d'Amphibiens du Muséum National d'Histoire Naturelle. Imprimerie Nationale, France.

Guibé, J., and M. Lamotte. 1960 [1961]. Deux espèces affines de batraciens africains longtemps confondues: *Ptychadena oxyrhynchus* (Smith) et *Pt. abyssinica* (Peters). Bulletin du Muséum national d'Histoire naturelle, Série 2, 32:380–391.

Günther, A.C.L.G. 1858. On the systematic arrangement of the tailless batrachians and the structure of *Rhinophrynus dorsalis*. Proceedings of the Zoological Society of London 1858:339–352.

Hartert, E. 1913. Expedition to the Central Western Sahara V. Reptiles and amphibians. Novitates Zoologicae 20:76–84.

Ibrahim, A.A. 2008. Contribution to the herpetology of southern Libya. Acta Herpetologica 3:35–49.

Jan, G. 1857. Cenni sul Museo Civico di Milano ed Indice Sistematico dei Rettili ed Anfibi Eposti nel Medesimo. Luigi di Giacomo Pirola, Italy.

Jan, G., and F. Sordelli. 1860–1882. Iconographie Générale des Ophidiens. Jan and Sordelli, Italy/J. B. Baillière et Fils, France.

Lanza, B. 1978. On some new or interesting East African amphibians and reptiles. Monitore zoologico italiano Supplemento 10:229–297.

Lanza, B. 1981. A check-list of the Somali amphibians. Monitore zoologico italiano Supplemento 15:151–186.

Lanza, B. 1990. Amphibians and reptiles of the Somali Democratic Republic: check list and biogeography. Biogeographia 14(1988):407–465.

Lanza, B., C. Pastorelli, P. Laghi, and R. Cimmaruta. 2005. A review of systematics, taxonomy, genetics, biogeography and natural history of the genus *Speleomantes* Dubois, 1984 (Amphibia Caudata Plethodontidae). Atti del museo civico di storia naturale di Trieste 52 Supplemento:5–135.

Lanza, B., F. Andreone, M.A. Bologna, C. Corti, and E. Razzetti. 2007. Fauna d'Italia, Vol. XLII. Amphibia. Edizione Calderini de Il Sole 24 ORE Editoria Specializzata, Italy.

Largen, M.J. 1997. An annotated checklist of the amphibians and reptiles of Eritrea, with keys for their identification. Tropical Zoology 10:63–115.

Largen, M.J. 1998. The status of the genus *Hyperolius* Rapp 1842 (Amphibia Anura Hyperoliidae) in Ethiopia. Tropical Zoology 11:61–82.

Largen, M.J. 2001a. The status of the genus *Phrynobatrachus* Günther 1862 in Ethiopia and Eritrea, including description of a new species (Amphibia Anura Ranidae). Tropical Zoology 14:287–306.

Largen, M.J. 2001b. Catalogue of the amphibians of Ethiopia, including a key for their identification. Tropical Zoology 14:307–402.

Largen, M.J., and S. Spawls. 2006. Lizards of Ethiopia (Reptilia Sauria): an annotated checklist, bibliography, gazetteer and identification key. Tropical Zoology 19:21–109.

Largen, M.J., and S. Spawls. 2010. The Amphibians and Reptiles of Ethiopia and Eritrea. Edition Chimaira, Frankfurt am Main, Germany.

Laurent, R.F. 1941 "1940". Contribution à l'ostéologie et à la systématique des ranides africains. Première note. Revue de Zoologie et de Botanique Africaines 34: 74–96.

Laurent, R. 1943. Les *Hyperolius* (Batraciens) du Musée du Congo. Annales du Musée du Congo Belge, C.–Zoologie, Poissons, Reptiles, Amphibies, Série I. 4:61–140.

Laurent, R. 1951. Catalogue des rainettes africaines (genres *Afrixalus* et *Hyperolius*) de la collection du Museum national d'Histoire naturelle de Paris. Annales de la Société royale zoologique de Belgique 82:23–50.

Laurent, R. 1952 [1951]. Aperçu des formes actuellement reconnaissables dans la superespece *Hyperolius marmoratus*. Annales de la Société royale zoologique de Belgique 82:379–397.

Laurenti, J.N. 1768. Specimen Medicum, Exhibens Synopsin Reptilium Emendatum cum Experimentis Circa Venena et Antidota Reptilium Austriacorum. Joan. Thom. nob. de Trattnern, Austria.

Leonardi, M., A. Quaroni, F. Rigato, and S. Scali. 1995. La collezioni del Museo Civico di Storia Naturale di Milano. Atti della Società italiana di scienze naturali e del Museo civico di storia naturale di Milano 135(1994):3–296.

Lötters, S. 1996. The Neotropical Toad Genus *Atelopus*: Checklist — Biology — Distribution. M. Vences and F. Glaw Verlags GbR, Germany.

Loveridge, A. 1932. Eight new toads of the genus *Bufo* from East and Central Africa. Occasional Papers of the Boston Society of Natural History 8:43–54.

Loveridge, A. 1936a. African reptiles and amphibians in Field Museum of Natural History. Field Museum of Natural History, Zoological Series 22:5–111.

Loveridge, A. 1936b. Scientific results of an expedition to rain forest regions in eastern Africa. VII. Amphibians. Bulletin of the Museum of Comparative Zoology 79:369–430, 3 plates.

Maciel, D.B., and I. Nunes. 2010. A new species of four-eyed frog genus *Pleurodema* Tschudi, 1838 (Anura: Leiuperidae) from the rock meadows of Espinhaço range, Brazil. Zootaxa 2640:53–61.

Mazzotti, S. (Ed.). 2010. Le Collezioni Erpetologiche dei Musei Italiani: Censimento e Analisi delle Collezioni di Anfibi e Rettili per la Loro Valorizzazione Scientifica. Museologia Scientifica Memorie, Number 5.

Mazzotti, S., and D. Miserocchi. 2010. Un modello di collezione erpetologica dei musei italiani: l'esempio del Museo di Storia Naturale di Ferrara. Pp. 106–117 *In* S. Mazzotti (Ed.), Le Collezioni Erpetologiche dei Musei Italiani: Censimento e Analisi delle Collezioni di Anfibi e Rettili per la Loro Valorizzazione Scientifica. Museologia Scientifica Memorie, Number 5.

Nascetti, G., R. Cimmaruta, B. Lanza, and L. Bullini. 1996. Molecular taxonomy of European plethodontid salamanders (genus *Hydromantes*). Journal of Herpetology 30:161–183.

Nistri, A. 2010. La collezione erpetologica della sezione di Zoologia "La Specola" del Museo di Storia Naturale dell'Università di Firenze. Pp. 118–128 *In* S. Mazzotti (Ed.), Le Collezioni Erpetologiche dei Musei Italiani: Censimento e Analisi delle Collezioni di Anfibi e Rettili per la Loro Valorizzazione Scientifica. Museologia Scientifica Memorie, Number 5.

Parisi, B. 1944. L'incendio del Museo di Storia Naturale di Milano. Natura 35:65–72.

Peracca, M.G. 1904. Rettili ed Anfibi dell'Eritrea raccolti dal Dott. Achille Tellini nel 1903. Bollettino dei Musei di Zoologia e Anatomia Comparata della R. Universita di Torino 19:1–6.

Perret, J.-L. 1977. Les *Hylarana* (Amphibiens, Ranidés) du Cameroun. Revue suisse de Zoologie 84:841–868.

Peters, W.C.H. 1878. Über die von Hrn. J. M. Hidebrandt während seiner letzten ostafrikansichen Reise gesammelten Säugethiere und Amphibien. Monatsberichte der Königlichen Preussische Akademie des Wissenschaften zu Berlin 1878:194–209.

Peters, W.C.H. 1882. Über eine neue Batrachier der Gattung *Hyperolius* und *Limnodytes* (*Hylorana*) aus Africa. Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin 1882:8–10.

Pfeffer, G. 1893. Ostafrikanische Reptilien und Amphibien, gesammelt von Herrn Dr. F. Stuhlmann im Jahre 1888 und 1889. Jahrbuch der Hamburgischen Wissenschaftlichen Anstalten 10:69–105.

Raffaëlli, J. 2007. Les Urodèles du Monde. Penclen Édition, Condé-sur-Noireau, France.

Rafinesque, C.S. 1814. Fine del Prodromo d'Erpetologia Siciliana. Specchio delle Scienze, o, Giornale Enciclopedico di Sicilia 2:102–104.

Rossi, A. 1931. Tra elefanti e pigmei. A Mondadori Ed., Verona, Italy.

Scali, S. 1996. Cataloghi delle collezioni erpetolgiche del Museo Civico di Storia Naturale di Milano. I. I serpenti italiani, con note storiche sulle collezioni erpetologiche. Atti della Società italiana di scienze naturali e del Museo civico di storia naturale di Milano 135:297–332.

Scali, S. 2010. Storia e importanza scientifica della collezione erpetologica del Museo Civico di Storia Naturale di Milano. Pp. 69–77 in S. Mazzotti (Ed.), Le Collezioni Erpetologiche dei Musei Italiani: Censimento e Analisi delle Collezioni di Anfibi e Rettili per la Loro Valorizzazione Scientifica. Museologia Scientifica Memorie, Number 5.

Schiøtz, A. 1975. The Treefrogs of Eastern Africa. Steenstrupia, Copenhagen, Denmark.

Schiøtz, A. 1999. Treefrogs of Africa. Edition Chimaira, Frankfurt am Main, Germany.

Scortecci, G. 1929. Contributo alla conoscenza degli anfibi dell'Eritrea. Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano 68:175–192, 2 plates.

Scortecci, G. 1930. Nuove specie di rettili ed anfibi del Mozambico e della Somalia italiana. Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano 69:319–321.

Scortecci, G. 1932a. Descrizione preliminare di un nuovo ofidio ed un anfibio della Somalia Italiana. Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano 71:58–60.

Scortecci, G. 1932b. Nuove specie di anfibi e rettili della Somalia Italiana. Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano 71:264–269.

Scortecci, G. 1933. Anfibi della Somalia Italiana. Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano 72:5–70, 5 plates.

Scortecci, G. 1936. Gli anfibi della Tripolitania. Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano 75:129–226, 3 plates.

Scortecci, G. 1941. Un nuovo genere di Microhylidae dell'impero italiano d'Etiopia. Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano 80:177–180.

Scortecci, G. 1943. Missione biologica sagan-omo. Zoologica 1:307–336.

Seetzen, U.J. 1855. Reisen durch Syrien, Palästina, Phönicien, die Transjordan-Länder, Arabia Petraea und Unter-Aegytpten. Volume 3. G. Reimer, Germany.

Smith, A. 1849. Illustrations of the Zoology of South Africa; Consisting Chiefly of Figures and Descriptions of the Objects of Natural History Collected during an Expedition into the Interior of South Africa, in the Years 1834, 1835, and 1836. Vol. III. Reptilia. Appendix. Smith, Elder, & Co., UK.

Steindachner, F. 1863. Über einige neue Batrachier aus den Sammlungen des Wiener Museums. Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Classe 48:186–192.

Steindachner, F. 1864. Batrachologische Mittheilungen. Verhandlungen des Zoologisch-Botanischen Vereins in Wien 14:239–288.

Sternfeld, R. 1917. Reptilia und Amphibia. Mecklenburg, A.F.H. z. ed., Ergebnisse der Zweiten Deutschen Zentral-Afrika-Expedition 1910–1911 unter Führung Adolph Friedrichs, Herzogs zu Mecklenburg. Volume 1 (Zoologie): 407–510. Klinkhardt & Biermann, Germany.

Tandy, M., and R.C. Drewes. 1985. Mating calls of the 'kassinoid' genera *Kassina*, *Kassinula*, *Phlyctimantis* and *Tornierella* (Anura: Hyperoliidae). South African Journal of Science 81:191–195.

Tandy, M., and D.J. Feener. 1985. Geographic variation in species of the *Bufo blanfordi* group (Amphibia: Anura: Bufonidae) and description of a new species. Pp. 549–585 *In* K.-L. Schuchmann (Ed.), Proceedings of the International Symposium on African Vertebrates: Systematics, Phylogeny and Evolutionary Ecology. Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany.

Tandy, M., and R. Keith. 1972. *Bufo* of Africa. Pp. 119–170 *In* W.F. Blair (Ed.), Evolution in the Genus *Bufo*. University of Texas Press, USA.

Visconti, A. 1988. I 150 anni del Museo Civico di Storia Naturale di Milano (1838–1988). Natura (Milano) 79:1–51.

Werner, F. 1896. Beiträge zur Kenntniss der Reptilien und Batrachier von Centralamerika und Chile, sowie einiger seltenerer Schlangenarten. Verhandlungen des Zoologisch-Botanischen Vereins in Wien 46:344–365.

Werner, F. 1908 "1907". Ergebnisse der mit Subvention aus der Erbschaft Treitl unternommenen zoologischen Forschungsreise Dr. Franz Werner's nach dem agyptischen Sudan und Nord-Uganda. XII. Die Reptilien und Amphibien. Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Classe 116:1823–1926.

Zimkus, B.M., and J.G. Larson. 2011. Examination of the molecular relationships of sand frogs (Anura: Pyxicephalidae: *Tomopterna*) and resurrection of two species from the Horn of Africa. Zootaxa 2933:27–45.

Published: 3 November 2014