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Digital diversity: publication of new names is now completely electronic

Nearly thirteen years ago, *Palaeontologia Electronica* became the first digital journal to publish new taxonomic names (Gee, 2000). Three new species of foraminifera were named by Takayanagi in a paper by Scott *et al.* (2000): *Eggerella matsunoi*, *Haplophragmoides hatai*, and *Haplophragmoides nishikizawensis* (Figure 1). Those names, whose validity was made possible by changes in the 4th Edition of the International Code of Zoological Nomenclature (ICZN, 1999), were heralds of the changing landscape of scientific publishing.

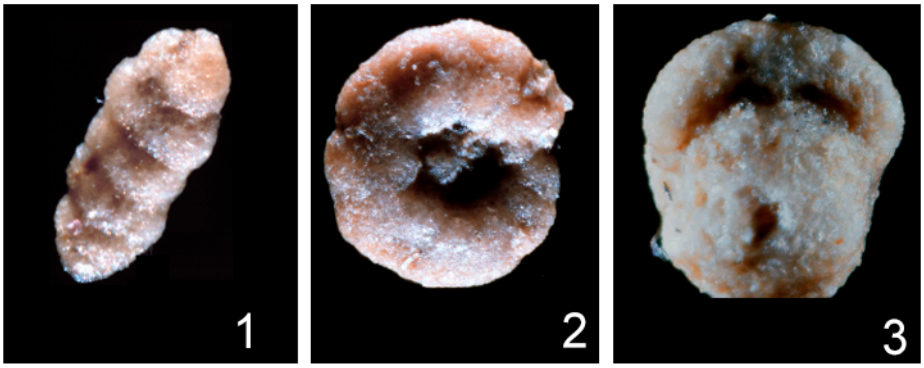

FIGURE 1. Type specimens of the first species names published in *Palaeontologia Electronica* by Takayanagi in 2000, the foraminifera *Eggerella matsunoi* (1), *Haplophragmoides hatai* (2), and *Haplophragmoides nishikizawensis* (3).

Rules of taxonomic nomenclature exist to provide an objective, fair, and stable means of applying names to species, genera, and family-level taxa. Those rules govern only names and say nothing about what biological principles should be used to define a taxon or what methods should be used to recognize one. The Principle of Priority states that when different names have been applied to the same taxon, the name that was first published takes priority over later ones. The Principle is invoked when a scientist revises a group using whatever tools and conventions are currently available and finds that two or more name-bearing holotype specimens are lumped together. The newly reconstituted group assumes the name of whichever type was first established. Perhaps the most famous application of the Principle of Priority was the synonymy of the widely known name *Brontosaurus* Marsh 1879 with the earlier name *Apatosaurus* Marsh 1877. Despite early recognition that the two belonged to the same genus, the junior name *Brontosaurus*

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was popularized in the 20th Century by skeletons exhibited with that name in the galleries of Yale's Peabody Museum and New York's American Museum of Natural History.

Who published which name first is therefore an important and sometimes contentious issue. Most taxonomic names are proposed with little fanfare, but in some cases authors compete for the right to name new species. O. C. Marsh, the author of *Brontosaurus* and *Apatosaurus*, and E. D. Cope were famously rivals in their 19th Century efforts to name new fossil taxa from the American west, sometimes dictating short papers by telegraph in effort to establish priority for their new names. For names to be correctly applied, it is important that the scientific community have access to the appropriate details: who named it, when was it named, what differentiates it from others, and where can the type material can be examined? The rules of nomenclature stipulate what constitutes a valid publication so that these questions can be objectively answered. Most important, a valid publication must be distributed widely in the scientific community in such a way that the who, when, what, and where cannot be falsified by an author to gain priority. If rivals like Cope and Marsh had been able to publish taxonomic names by nailing broadsheets to church doors in Laramie, they would have been able to get them out instantly but the scientific community would likely have no record of them. Likewise if rivals were able to back-date publications in order to attain priority, a tit-for-tat response could escalate until the dates on the papers were older than the fossils themselves. The surest way to prevent such behavior is to require that papers that name new species be published in a durable, widely distributed format. If everyone has a copy of the description, nobody can falsify the details.

Electronic publication has been a challenge for the rules of nomenclature, not because of its digital nature per se, but because of the client-server model. Most digital publishing is done over the World Wide Web. The original files are stored on the publishers server and readers use client software, such as an Internet browser with a PDF reader plug-in, to access the files. The publisher has the technical capability of altering the original files at any time, thus jeopardizing the very principle that the rules of nomenclature exist to protect. If rivals like Cope and Marsh were electronic publishers, one can easily imagine rampant revisionism. Until 2012, therefore, both the ICZN and the International Code of Botanical Nomenclature (ICBN, which was recently renamed the International Code of Nomenclature for Algae, Fungi, and Plants) insisted that durable copies be made widely available to ensure that fraud could be detected.

The 4th edition of the ICZN in 2000 made allowances for electronic publishing, so long as durable, simultaneously produced versions of the work were widely distributed. *PE* served as a valid publisher for Takayanagi's names because we started pressing CD-ROMs of our issues that we archived in several libraries around the world and sold at cost to subscribers. Unsurprisingly, the CDs were in low demand since our pages also appeared open-access in HTML and PDF format on the Internet, but the principles enshrined in the Code to prevent fraud were met. The publication of the "Vienna Code", as the 2005 edition of the ICBN is known, similarly recognized electronic publication for botanical names so long as durable, simultaneously produced versions of the work were distributed in printed format. *PE* converted its archival format from CD-ROM to print (at great increase in cost) and was then able to validly publish plant, algal, and fungal names. We also made the print volumes available at cost through the print-on-demand services of Lulu.com. The nightmare vision expressed by former *PE* Executive Editor Norman Macleod that, "I would be severely depressed if in ten years I walk into an office and find a series of bound volumes of PE printouts" (Gee, 2000) had nearly come true since we still publishing the print volumes in 2010 thanks to the Vienna Code. Nevertheless, we were able to publish our first plant name, *Rhabdophyllites diapros*, a name given by Danehy et al. in 2007 to a dicot plant from the Eocene of Mississippi (Figure 2).

The distinction between the durable and the on-line copies of papers created new areas of uncertainty for nomenclature. According to the rules, priority stemmed from the durable, distributed copy of the publication, not the on-line version. So long as the durable version was produced at the same time as the on-line version went live, there was no

problem. However, the growth of "early on-line" editions of print journals often put new names into public view before the printed version established the formal date for priority. Names in the early on-line edition were formally *nomen nudums* without priority according to the nomenclature rules until the print edition was distributed. In some cases this led to an electronic age rivalry for taxonomic priority. For example, Gündüz and colleagues named *Spermophilus taurensis*, a new ground squirrel from Turkey, in the journal *Molecular Phylogenetics and Evolution* (Gündüz *et al*., 2007a). After the early on-line edition of the paper was published in February 2007, Özkurt and colleagues submitted a manuscript to the journal *Zootaxa* applying the name *Spermophilus torosensis* to the same species. The latter was published 19 July (Özkurt *et al.* 2007), only weeks after the former came out in print in June. *Spermophilus taurensis* retained priority, but only narrowly (Gündüz *et al.*, 2007b).

Starting last year, truly electronic, online publications are recognized by both codes. The botanists were first, recognizing PDFs as valid publications in the new Code (ICN, 2012). The principle on which this change was based is that PDFs are easily downloaded and saved by readers, archived by libraries, and harvested by on-line repositories. Thus, even though PDFs are not physically durable, they are so widely distributed that it would be difficult for a publisher to alter all copies after the original publication, regardless of the fact that they retain control over the original server files. The ICZN followed suite in September, 2012 by amending the 4th Edition of the Code to allow purely electronic publications to be considered valid from 2011 onward with the stipulation that names be registered in the digital name repository ZooBank (zoobank.org) and that evidence of the registration be published in the work (ICZN, 2012). Upon registration, ZooBank issues an LSID (Life Science Identifier), which is a unique identification number presented in uniform resource name (URN) format, that serves as a "watermark" for the new name in the digital publication and which can be used to retrieve it from the ZooBank archive. Ironically for *PE's* first electronic taxonomic names, publication by CD-ROM is no longer recognized as valid under the amended ICZN.

FIGURE 2. Type specimen of *Rhabdophyllites diapros,* the first plant species name published in *Palaeontologia Electronica* by Danehy *et al.* in 2007.

Starting in 2013, we register all new taxonomic names in ZooBank and publish the LSID to comply with the new rules. We now ask our authors to provide us with the details necessary to register names at the time they submit their manuscripts. We have also registered in ZooBank all 95 zoological names that we published since 2000, including Takayangi's first three (Table 1). To further comply with the new rules, *PE* will be digitally archived with the CLOCKSS, a non-profit archiving venture between publishers and librar-

ies that provide access to electronic periodicals in perpetuity (clockss.org/), through a partnership with the Indiana University ScholarWorks initiative (scholarworks.iu.edu/). Finally MacLeod's vision of a truly paper-less electronic paleontology journal has been realized.

REFERENCES

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Gündüz, İ., Jaarola, M., Tez, C., Yeniyurt, C., Polly, P. D. and Searle, J. B. 2007a. Multigenic and morphometric differentiation of ground squirrels (*Spermophilus*, Scuiridae, Rodentia) in Anatolia, with a description of a new species. *Molecular Phylogenetics and Evolution* 43: 916-935.

Gündüz, İ., Jaarola, M., Tez, C., Yeniyurt, C., Polly, P. D. and Searle, J. B. 2007b. *Spermophilus taurensis* Günduz *et al.* 2007 and *S. torosensis* Özkurt *et al.*, 2007 (Scuiridae, Rodentia) are synonyms for the same species of Ground squirrel from the Taurus Mountains of southern Turkey. *Zootaxa*, 1663: 67-68.

ICN 2012. *International Code of Nomenclature for Algae, Fungi, and Plants (Melbourne Code).* (Regnum Vegetabile 154). Koeltz Scientific Books: Koenigstein, Germany.

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TABLE 1. A list of all new taxonomic names published in Palaeontologia Electronica prior to May, 2013. ICBN = International Code of Botanical Nomenclature; ICZN = International Code of Zoological Nomenclature; Ichnotaxon = Ichnological name; LSID = Life Sciences Identifier of the ZooBank record for the taxon name at http://www.zoobank.org/.

Code	Taxon name	Year	Full citation	LSID
ICBN	*Rhabdophyllites*	2007	Danehy, Daniel R., Wilf, Peter, and Little, Stefan A. 2007. Early Eocene Macroflora from the Red Hot Truck Stop Locality (Meridian, Mississippi, USA). *Palaeontologia Electronica* Vol. 10, Issue 3; 17A:31p.	NA
ICBN	*Rhabdophyllites diapyros*	2007	Danehy, Daniel R., Wilf, Peter, and Little, Stefan A. 2007. Early Eocene Macroflora from the Red Hot Truck Stop Locality (Meridian, Mississippi, USA). *Palaeontologia Electronica* Vol. 10, Issue 3; 17A:31p.	NA
ICBN	*Synchytrium permicus*	2007	García Massini, J.L., 2007. A Possible Endoparasitic Chytridiomycete Fungus from the Permian of Antarctica. *Palaeontologia Electronica* Vol. 10, Issue 3; 16A:14p	NA
Ichnotaxon	*Fossichnus*	2003	Nielsen, K. S. S., J. K. Nielsen, and R. G.e Bromley, 2003. Palaeoecological and Ichnological Significance of Microborings in Quaternary Foraminifera. *Palaeontologia Electronica* 6(2):13pp, 11KB.	NA
Ichnotaxon	*Fossichnus solus*	2003	Nielsen, K. S. S., J. K. Nielsen, and R. G.e Bromley, 2003. Palaeoecological and Ichnological Significance of Microborings in Quaternary Foraminifera. *Palaeontologia Electronica* 6(2):13pp, 11KB.	NA
Ichnotaxon	*Tacheria*	2011	Krapovickas, Verónica and Nasif, Norma L. 2011. Large caviomorph rodent footprints of the Late Oligocene Vinchina Formation, Argentina. *Palaeontologia Electronica* Vol. 14, Issue 2; 12A:13p;	NA
Ichnotaxon	*Tacheria troyana*	2011	Krapovickas, Verónica and Nasif, Norma L. 2011. Large caviomorph rodent footprints of the Late Oligocene Vinchina Formation, Argentina. *Palaeontologia Electronica* Vol. 14, Issue 2; 12A:13p;	NA
ICZN	*Acanthotheca*	2011	Vendrasco MJ, Kouchinsky AV, Porter SM, and Fernandez CZ. 2011. Phylogeny and escalation in Mellopegma and other Cambrian molluscs. *Palaeontologia Electronica* 14.2.11A:1-44.	4F676594-96B5-4F6A-9C47-C3A319ABD773
ICZN	*Alilepus elongatus*	2011	Winkler AJ, Flynn LJ, and Tomida Y. 2011. Fossil lagomorphs from the Potwar Plateau, northern Pakistan. *Palaeontologia Electronica* 14.3.38A:1-16.	65980101-A9A2-474F-82E0-275A11560EE5
ICZN	*Aljutovella gorgiji*	2006	Leven EJ, Davydov VI, and Gorgij MN. 2006. Pennsylvanian Stratigraphy and Fusulinids of Central and Eastern Iran. *Palaeontologia Electronica* 9.1.1A:1-36.	0AC12965-7EF2-404C-9B55-452BE516F3B3
ICZN	*Aljutovella iranica*	2006	Leven EJ, Davydov VI, and Gorgij MN. 2006. Pennsylvanian Stratigraphy and Fusulinids of Central and Eastern Iran. *Palaeontologia Electronica* 9.1.1A:1-36.	F7558F47-69C8-4D8A-829A-66FA47785642
ICZN	*Aljutovella stocklini*	2006	Leven EJ, Davydov VI, and Gorgij MN. 2006. Pennsylvanian Stratigraphy and Fusulinids of Central and Eastern Iran. *Palaeontologia Electronica* 9.1.1A:1-36.	5C578C1E-EE35-4578-B9A6-B46B06B086CC
ICZN	*Axestemys cerevisia*	2012	Vitek NS, 2012. Giant fossil soft-shelled turtles of North America. *Palaeontologia Electronica* 15.1.13A,1-43.	1C9C11D3-C11F-4596-BA39-21EACBCD15E2
ICZN	*Axestemys montinsana*	2012	Vitek NS, 2012. Giant fossil soft-shelled turtles of North America. *Palaeontologia Electronica* 15.1.13A,1-43.	B21025A3-B087-4BF6-9359-AFE50FAA76A4
ICZN	*Cernictis repenningi*	2011	Baskin JA. 2011. A new species of Cernictis (Mammalia, Carnivora, Mustelidae) from the Late Miocene Bidahochi Formation of Arizona, USA. *Palaeontologia Electronica* 14.3.26A:1-7.	E5F49686-96B4-444F-BD27-056FB0ACD960
ICZN	*Chotaophis*	2005	Head, J.J. 2005. Snakes of the Siwalik Group (Miocene of Pakistan): Systematics and Relationship to Environmental Change, *Palaeontologia Electronica*, 8.1.18A: 1-33.	ECA8D316-58D3-4030-9D60-4749DFB2C45A

Code	Taxon name	Year	Full citation	LSID
ICZN	*Chotaophis padhriensis*	2005	Head, J.J. 2005. Snakes of the Siwalik Group (Miocene of Pakistan): Systematics and Relationship to Environmental Change, *Palaeontologia Electronica*, 8.1.18A: 1-33.	C18AD99B-E7EB-4905-B789-6575387E66F7
ICZN	*Chrysochloris arenosa*	2010	Asher RJ, and Avery DM, 2010. New Golden Moles (Afrotheria, Chrysochloridae) from the Early Pliocene of South Africa. *Palaeontologia Electronica* 13.1.3A:1-12.	C5AA3AE0-1D20-44D7-938B-38195014197D
ICZN	*Chrysochloris bronneri*	2010	Asher RJ, and Avery DM, 2010. New Golden Moles (Afrotheria, Chrysochloridae) from the Early Pliocene of South Africa. *Palaeontologia Electronica* 13.1.3A:1-12.	5E4A86DD-A601-4CB0-A356-B9DD6FF56DED
ICZN	*Cladocyclus pankowskii*	2007	Forey PL and Cavin L, 2007. A New Species of Cladocyclus (Teleostei: Ichthyodectiformes) from the Cenomanian of Morocco. *Palaeontologia Electronica* 10.3.12A:1-10.	53C0C37C-51E1-4A8E-98C1-DE1B91F1EB53
ICZN	*Condorlepis*	2013	López-Arbarello, Adriana, Sferco, Emilia, and Rauhut, Oliver W.M. 2013. A new genus of coccolepidid fishes (Actinopterygii, Chondrostei) from the continental Jurassic of Patagonia, *Palaeontologia Electronica* Vol. 16, Issue 1; 7A 23p.	D9B9DCC8-6B5E-4BA4-9BC8-5335E0478B70
ICZN	*Cystolonsdaleia danneri*	2009	Stevens CH., 2009. New Occurrences of Permian Corals from the McCloud Belt in Western North America. *Palaeontologia Electronica* 12.2.6A:1-16	9F2BFDB8-C44A-4502-8DD2-1B4FEB796E19
ICZN	*Digmocythere cronini*	2003	Elewa, Ashraf M.T., 2003. Morphometric studies on three ostracod species of the genus Digmocythere Mandelstam from the middle Eocene of Egypt. *Palaeontologia Electronica* 6(2):11p, 95KB.	CCA036B9-3E2A-4AAD-86B1-06F1C6768BE2
ICZN	*Dryomys apulus*	2006	Freudenthal, Matthijs, and Martín-Suárez, Elvira, 2006. Gliridae (Rodentia, Mammalia) from the Late Miocene Fissure Filling Biancone 1 (Gargano, Province of Foggia, Italy). *Palaeontologia Electronica* Vol. 9, Issue 2; 6A:23p	757CBDBD-6283-41C7-B1C2-0F780F1277CC
ICZN	*Eggerella matsunoi*	2000	Scott, David B. Y. Takayanagi, S. Hasegawa, and T. Saito. 2000. Illustration and Reevaluation of Affinities of Neogene Foraminifera Described From Japan. *Palaeontologia Electronica* 3.2.8A:1-41p	7F285D10-7915-4F6B-BEE5-9DBCAEF1AD2D
ICZN	*Eoconodon hutchisoni*	2011	Clemens WA. 2011. Eoconodon ("Triisodontidae," Mammalia) from the Early Paleocene (Puercan) of northeastern Montana, USA. *Palaeontologia Electronica* 14.3.22A:1-22.	E5EB3801-F353-4E56-9048-2C0B14BC7430
ICZN	*Eoparafusulina grozdilovae*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	EE57D117-2C78-4C7D-9052-1F800428C919
ICZN	*Eoparafusulina isobella*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	295364A3-74A6-4D3E-B703-8BC032E161A7
ICZN	*Eoparafusulina madbeiki*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	886FE060-156A-476E-8B9A-146B888305EB
ICZN	*Eoparafusulina minuta*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	E3915432-9BBD-434D-9D0D-F0CE1CAD39A2
ICZN	*Eoparafusulina ruttneri*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	7B6915F1-979F-4213-890C-EF5D4D84D80E

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ICZN	*Eoparafusulina shemiraniensis*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	3C93521D-7603-4BFA-8424-5A0ECC73EE56
ICZN	*Eoparafusulina stevensi*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	8DEC23BC-2D52-4E3B-80AF-6079E5056FD9
ICZN	*Gansophis*	2005	Head, J.J. 2005. Snakes of the Siwalik Group (Miocene of Pakistan): Systematics and Relationship to Environmental Change, *Palaeontologia Electronica*, 8.1.18A: 1-33.	7A1C3BC8-484B-44AA-B69D-0CB881D4CC60
ICZN	*Gansophis potwarensis*	2005	Head, J.J. 2005. Snakes of the Siwalik Group (Miocene of Pakistan): Systematics and Relationship to Environmental Change, *Palaeontologia Electronica*, 8.1.18A: 1-33.	BD3A926B-7B60-42A5-AF0A-165D4546C644
ICZN	*Gobiolagus burkei*	2005	Meng J, Hu Y and Li D. 2005. Gobiolagus (Lagomorpha, Mammalia) from Eocene Ula Usu, Inner Mongolia, and Comments on Eocene Lagomorphs of Asia, *Palaeontologia Electronica* 8.1.7A:1-23.	0BDDC9B8-69D5-4E98-8B3D-2F6F4AD79986
ICZN	*Gondtherium*	2007	Prasad, G.V.R. and Manhas, B.K., 2007. A New Docodont Mammal from the Jurassic Kota Formation of India. *Palaeontologia Electronica* Vol. 10, Issue 2; 7A:11	ED8B81EE-7DE8-44D6-864A-12DB27864ADC
ICZN	*Gondtherium dattai*	2007	Prasad, G.V.R. and Manhas, B.K., 2007. A New Docodont Mammal from the Jurassic Kota Formation of India. *Palaeontologia Electronica* Vol. 10, Issue 2; 7A:11	06C9B45E-21F6-4170-8137-1D5BB02CFC19
ICZN	*Grovesella*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	91CF8809-C91A-4FBB-8770-9125C21D821F
ICZN	*Grovesella tabasensis*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	30DC3B1C-BE26-4AFD-9E74-62FDA9C29B04
ICZN	*Grzybowskia jasoni*	2003	Lunt, Peter. 2003. Biogeography of Some Eocene Larger Foraminifera, and Their Application in Distinguishing Geological Plates. *Palaeontologia Electronica* 6(1): 22, 1.3MB;	FA0529F2-46AA-4B55-85EB-A03CA6ECF264
ICZN	*Haplophragmoides hatai*	2000	Scott, David B. Y. Takayanagi, S. Hasegawa, and T. Saito. 2000. Illustration and Reevaluation of Affinities of Neogene Foraminifera Described From Japan. *Palaeontologia Electronica* 3.2.8A:1-41p	D317C3BC-F8BD-4989-863D-217337E221B7
ICZN	*Haplophragmoides nishikizawensis*	2000	Scott, David B. Y. Takayanagi, S. Hasegawa, and T. Saito. 2000. Illustration and Reevaluation of Affinities of Neogene Foraminifera Described From Japan. *Palaeontologia Electronica* 3.2.8A:1-41p	ADF909AC-B943-429F-887C-D60C013DE65B
ICZN	*Hesperolagomys niobrarensis*	2011	Bair AR,, 2011. Description of a new species of the North American archaic pika Hesperolagomys (Lagomorpha: Ochotonidae) from the middle Miocene (Barstovian) of Nebraska and reassessment of the genus Hesperolagomys. *Palaeontologia Electronica* 14.1.6A:1-49	3EFC8F0B-EAFB-4F1A-80CF-829BB71182F8
ICZN	*Hyaenodon weilini*	2005	Wang X, Qiu Z, and Wang B, 2005. Hyaenodonts and Carnivorans from the Early Oligocene to Early Miocene of Xianshuihe Formation, Lanzhou Basin, Gansu Province, China, *Palaeontologia Electronica* 8.1.6A:1-14.	049079AA-C169-45FC-974D-CFF9F0A294CA
ICZN	*Jacobsomys dailyi*	2011	May, Steven R., Woodburne, Michael O., Lindsay, Everett H., Albright, L. Barry, Sarna-Wojcicki, Andrei, Wan, Elmira, and Wahl, David B. 2011. Geology and mammalian paleontology of the Horned Toad Hills, Mohave Desert, California, USA. *Palaeontologia Electronica* Vol. 14, Issue 3; 28A:63p.	42BCE1C5-F2F6-4284-9EE2-D84540888439

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ICZN	*Karongasaurus*	2005	Gomani, E. M., 2005. Sauropod Dinosaurs from the Early Cretaceous of Malawi, Africa, *Palaeontologia Electronica* Vol. 8, Issue 1; 27A:37p, 6.9MB.	A2D1E52D-DC52-4B53-84F2-38C201648C96
ICZN	*Karongasaurus gittelmani*	2005	Gomani, E. M., 2005. Sauropod Dinosaurs from the Early Cretaceous of Malawi, Africa, *Palaeontologia Electronica* Vol. 8, Issue 1; 27A:37p, 6.9MB.	B02AB0AF-21B3-402C-A678-C5357AD12BF5
ICZN	*Lepidotes pankowskii*	2011	Forey PL, López-Arbarello A, and MacLeod N, 2011. A New Species of Lepidotes (Actinopterygii: Semiontiformes) from the Cenomanian (Upper Cretaceous) of Morocco. *Palaeontologia Electronica* 14.1.7A:1-12.	F2733B4F-CF6B-40FC-B4FF-B47175C14D41
ICZN	*Megapeomys repenningi*	2011	Tomida Y. 2011. A new species of the genus Megapeomys (Mammalia, Rodentia, Eomyidae) from the Early Miocene of Japan. *Palaeontologia Electronica* 14.3.25A:1-6.	2D708BB4-BF2C-4639-B894-CC8039D9662A
ICZN	*Mellopegma schizocheras*	2011	Vendrasco MJ, Kouchinsky AV, Porter SM, and Fernandez CZ. 2011. Phylogeny and escalation in Mellopegma and other Cambrian molluscs. *Palaeontologia Electronica* 14.2.11A:1-44.	A34F0B4A-9AFC-478B-9E8F-581D40472027
ICZN	*Moncharmontzeiana*	2010	Patterson, R. Timothy, 2010. MONCHARMONTZEIANA: New Name for Pytine Moncharmont Zei and Sgarella, 1978 Non Fortey, 1975. *Palaeontologia Electronica* Vol. 13, Issue 2; 10A: 2p	E37980D4-E419-4544-B4F0-594BB6A51F82
ICZN	*Neodutkevitchia*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	95565C24-A2B3-4453-AD51-40EC5CAEF2D2
ICZN	*Neodutkevitchia complicata*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	6DB2C8B6-34EF-4229-AE5E-04C903D43526
ICZN	*Neodutkevitchia partoazari*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	E6E408D3-577B-42EF-A19E-0EAE03DAB96D
ICZN	*Neodutkevitchia snyderi*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	66E38E01-1785-4C5A-94B9-DBA1D06019B8
ICZN	*Neodutkevitchia spinosai*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	F779AB52-89B0-4D71-8A72-575FE3F4DD54
ICZN	*Nesiotites rafelinensis*	2012	Rofes, Juan, Bover, Pere, Cuenca-Bescós, Gloria, and Alcover, Josep Antoni. 2012. Nesiotites rafelinensis sp. nov., the earliest shrew (Mammalia, Soricidae) from the Balearic Islands, Spain. *Palaeontologia Electronica* Vol. 15, Issue 1; 8A,12p	6E868F2C-AE28-40DF-984F-CCA64EAD04FA
ICZN	*Oesolcucumaria*	2012	Botting, Joseph P. and Muir, Lucy A. 2012. Fauna and ecology of the holothurian bed, Llandrindod, Wales, UK (Darriwilian, Middle Ordovician), and the oldest articulated holothuria. *Palaeontologia Electronica* Vol. 15, Issue 1; 9A,28p;	9EA41CF1-FF8F-44E4-BAAA-7948A488A465
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ICZN	*Oosterinkia neerlandica*	2011	Klompmaker, Adiël A. and Fraaije, René H.B., 2011. The oldest (Middle Triassic, Anisian) lobsters from the Netherlands: taxonomy, taphonomy, paleoenvironment, and paleoecology. *Palaeontologia Electronica* Vol. 14, Issue 1; 1A:15p;	799E8DAC-CDFC-49AE-BA64-E4FF48E87C07
ICZN	*Paluxysaurus*	2007	Rose, Peter J., 2007. A New Titanosauriform Sauropod (Dinosauria: Saurischia) from the Early Cretaceous of Central Texas and its Phylogenetic Relationships. *Palaeontologia Electronica* Vol. 10, Issue 2; 8A:65p	52E525E6-17C4-4C12-B8C9-BC42814616A9
ICZN	*Paluxysaurus jonesi*	2007	Rose, Peter J., 2007. A New Titanosauriform Sauropod (Dinosauria: Saurischia) from the Early Cretaceous of Central Texas and its Phylogenetic Relationships. *Palaeontologia Electronica* Vol. 10, Issue 2; 8A:65p	AF416763-9CFB-4086-9345-F3EB25135B29
ICZN	*Pararhizomys qinensis*	2005	Zhaoqun Z, Flynn LJ, and Zhuding Q, 2005. New Materials of Pararhizomys from Northern China, *Palaeontologia Electronica* 8.1.5A:1-9.	69F06920-6234-4AA6-98F6-0FCD7441A73E
ICZN	*Peradectes coprexeches*	2011	Williamson TE and Taylor LH. 2011. New species of Peradectes and Swaindelphys (Mammalia: Metatheria) from the Early Paleocene (Torrejonian) Nacimiento Formation, San Juan Basin, New Mexico, USA. *Palaeontologia Electronica* 14.3.23A:1-16.	F5071B3D-D913-4E8C-871A-BA0B5B89FB35
ICZN	*Perigondwania*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	B73DA936-D0F6-41F2-A13B-D347E1192A69
ICZN	*Perigondwania aghanabatii*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	CB2D4E02-4646-4D62-94C3-EDA5D9D48826
ICZN	*Perigondwania pseudosulcata*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	EA867FA8-7987-4258-908A-142D3EE02E06
ICZN	*Perigondwania rahdariensis*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	DB3A9DB5-5721-484C-8733-5707C9D2D86E
ICZN	*Placopsilina spongiphila*	2006	Guilbault, J-P, Krautter M, Conway KW, and Barrie JV. 2006. Modern foraminifera attached to Hexactinellid sponge meshwork on the West Canadian Shelf: Comparison with Jurassic Counterparts from Europe . *Palaeontologia Electronica* 9.1.3A:1-48.	878DFE2A-D466-494E-9A29-93608FB6511F
ICZN	*Polychrus charisticus*	2006	Smith, Krister T. 2006. A Diverse New Assemblage of Late Eocene Squamates (Reptilia) from the Chadron Formation of North Dakota, U.S.A. *Palaeontologia Electronica* Vol. 9, Issue 2; 5A:44p	C9562C2E-897F-429F-9830-4E9568893387
ICZN	*Profusulinella pseudoparva*	2006	Leven EJ, Davydov VI, and Gorgij MN. 2006. Pennsylvanian Stratigraphy and Fusulinids of Central and Eastern Iran. *Palaeontologia Electronica* 9.1.1A:1-36.	C426CBD0-D13C-4003-B2E3-EA47CB426E76
ICZN	*Prothomomys*	2011	May, Steven R., Woodburne, Michael O., Lindsay, Everett H., Albright, L. Barry, Sarna-Wojcicki, Andrei, Wan, Elmira, and Wahl, David B. 2011. Geology and mammalian paleontology of the Horned Toad Hills, Mohave Desert, California, USA. *Palaeontologia Electronica* Vol. 14, Issue 3; 28A:63p.	CD06B262-451A-49CF-911D-67209858B7C3

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ICZN	*Prothomomys warrenensis*	2011	May, Steven R., Woodburne, Michael O., Lindsay, Everett H., Albright, L. Barry, Sarna-Wojcicki, Andrei, Wan, Elmira, and Wahl, David B. 2011. Geology and mammalian paleontology of the Horned Toad Hills, Mohave Desert, California, USA. *Palaeontologia Electronica* Vol. 14, Issue 3; 28A:63p.	D6436131-E5B1-47F1-A687-650EEE4BCE43
ICZN	*Pseudocystophora wilsoni*	2009	Stevens CH., 2009. New Occurrences of Permian Corals from the McCloud Belt in Western North America. *Palaeontologia Electronica* 12.2.6A:1-16	996F8E7D-ED6C-42EA-9EB8-D60E3D06335B
ICZN	*Pseudogarypus synchrotron*	2012	Henderickx H, Tafforeau P, and Soriano C 2012. Phase-contrast synchrotron microtomography reveals the morphology of a partially visible new Pseudogarypus in Baltic amber (Pseudoscorpiones: Pseudogarypidae). *Palaeontologia Electronica* 15.2.17A,1-11	6E4EA9B8-F113-4082-9622-AF1DA0775874
ICZN	*Putrella persica*	2006	Leven EJ, Davydov VI, and Gorgij MN. 2006. Pennsylvanian Stratigraphy and Fusulinids of Central and Eastern Iran. *Palaeontologia Electronica* 9.1.1A:1-36.	D5C22BAE-3446-4E39-BA3C-64512F979452
ICZN	*Ramulina siphonifera*	2006	Guilbault, J-P, Krautter M, Conway KW, and Barrie JV. 2006. Modern foraminifera attached to Hexactinellid sponge meshwork on the West Canadian Shelf: Comparison with Jurassic Counterparts from Europe . *Palaeontologia Electronica* 9.1.3A:1-48.	500E6F59-4256-4E7F-AD8E-657D646129A1
ICZN	*Saniwa edura*	2006	Smith, Krister T. 2006. A Diverse New Assemblage of Late Eocene Squamates (Reptilia) from the Chadron Formation of North Dakota, U.S.A. *Palaeontologia Electronica* Vol. 9, Issue 2; 5A:44p	255F4330-8EA0-43DD-8B81-3579762FA3B5
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ICZN	*Sivaophis downsi*	2005	Head, J.J. 2005. Snakes of the Siwalik Group (Miocene of Pakistan): Systematics and Relationship to Environmental Change, *Palaeontologia Electronica*, 8.1.18A: 1-33.	429C043D-6951-4A17-8470-6059B6818598
ICZN	*Stertomys daamsi*	2006	Freudenthal, Matthijs, and Martín-Suárez, Elvira, 2006. Gliridae (Rodentia, Mammalia) from the Late Miocene Fissure Filling Biancone 1 (Gargano, Province of Foggia, Italy). *Palaeontologia Electronica* Vol. 9, Issue 2; 6A:23p	25E9214A-8C20-43E1-A52C-32C8C2EBBABA
ICZN	*Stertomys daunius*	2006	Freudenthal, Matthijs, and Martín-Suárez, Elvira, 2006. Gliridae (Rodentia, Mammalia) from the Late Miocene Fissure Filling Biancone 1 (Gargano, Province of Foggia, Italy). *Palaeontologia Electronica* Vol. 9, Issue 2; 6A:23p	336A32CC-80E9-4BFA-AC63-A133CC00A799
ICZN	*Swaindelphys encinensis*	2011	Williamson TE and Taylor LH. 2011. New species of Peradectes and Swaindelphys (Mammalia: Metatheria) from the Early Paleocene (Torrejonian) Nacimiento Formation, San Juan Basin, New Mexico, USA. *Palaeontologia Electronica* 14.3.23A:1-16.	01999455-C8E4-4506-B52C-DAC359AB4A82
ICZN	*Swaindelphys johansoni*	2011	Williamson TE and Taylor LH. 2011. New species of Peradectes and Swaindelphys (Mammalia: Metatheria) from the Early Paleocene (Torrejonian) Nacimiento Formation, San Juan Basin, New Mexico, USA. *Palaeontologia Electronica* 14.3.23A:1-16.	78B2F8A4-9C02-44AB-8165-7010CC6ACC9A
ICZN	*Tanzanycteridae*	2003	Gunnell, G. F., B. F. Jacobs, P. S. Herendeen, J. J. Head, E. Kowalski, C. P. Msuya, F. A. Mizambwa, T. Harrison, J. Habersetzer, and G. Storch, 2003. Oldest Placental Mammal from Sub-Saharan Africa: Eocene Microbat from Tanzania – Evidence for Early Evolution of Sophisticated Echolocation. *Palaeontologia Electronica* 5(3):10pp, 672KB.	0FCFE14B-A915-4829-86C1-B4B40A2F9462

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ICZN	*Tanzanycteris*	2003	Gunnell, G. F., B. F. Jacobs, P. S. Herendeen, J. J. Head, E. Kowalski, C. P. Msuya, F. A. Mizambwa, T. Harrison, J. Habersetzer, and G. Storch, 2003. Oldest Placental Mammal from Sub-Saharan Africa: Eocene Microbat from Tanzania – Evidence for Early Evolution of Sophisticated Echolocation. *Palaeontologia Electronica* 5(3):10pp, 672KB.	F6D1C9CC-EA50-45BA-B30B-F0459523C24F
ICZN	*Tanzanycteris mannardi*	2003	Gunnell, G. F., B. F. Jacobs, P. S. Herendeen, J. J. Head, E. Kowalski, C. P. Msuya, F. A. Mizambwa, T. Harrison, J. Habersetzer, and G. Storch, 2003. Oldest Placental Mammal from Sub-Saharan Africa: Eocene Microbat from Tanzania – Evidence for Early Evolution of Sophisticated Echolocation. *Palaeontologia Electronica* 5(3):10pp, 672KB.	3BABFD67-4029-427A-95A0-E2CF29879026
ICZN	*Timanites*	2007	Davydov, Vladimir I. and Arefifard, Sakineh, 2007. Permian Fusulinid Fauna of Peri-Gondwanan Affinity from the Kalmard Region, East-central Iran and its Significance for Tectonics and Paleogeography. *Palaeontologia Electronica* Vol. 10, Issue 2; 10A:40	7C078D1A-FDCA-49D0-B477-1BC6B71A74E2
ICZN	*Tinosaurus indicus*	2008	Prasad GVR and Bajpai S, 2008. Agamid Lizards from the Early Eocene of Western India: Oldest Cenozoic Lizards from South Asia. *Palaeontologia Electronica* 11.1.4A:1-19	1DA155BA-0D70-4A70-9A4E-571EC27E8BCE
ICZN	*Tuberculacerta*	2006	Smith, Krister T. 2006. A Diverse New Assemblage of Late Eocene Squamates (Reptilia) from the Chadron Formation of North Dakota, U.S.A. *Palaeontologia Electronica* Vol. 9, Issue 2; 5A:44p	83ABF6F6-5AC1-4668-9D94-EDC443DB39F1
ICZN	*Tuberculacerta pearsoni*	2006	Smith, Krister T. 2006. A Diverse New Assemblage of Late Eocene Squamates (Reptilia) from the Chadron Formation of North Dakota, U.S.A. *Palaeontologia Electronica* Vol. 9, Issue 2; 5A:44p	F3545693-7270-442B-9623-825FAAB38BCA
ICZN	*Ugandamys*	2005	Winkler, A. J., MacLatchy, L. and Mafabi, M. 2005. Small Rodents and a Lagomorph from the Early Miocene Bukwa Locality, Eastern Uganda, *Palaeontologia Electronica* Vol. 8, Issue 1; 24A:12p, 787MB.	CD8F45B6-C005-4291-92EF-104F56ABAED2
ICZN	*Ugandamys downsi*	2005	Winkler, A. J., MacLatchy, L. and Mafabi, M. 2005. Small Rodents and a Lagomorph from the Early Miocene Bukwa Locality, Eastern Uganda, *Palaeontologia Electronica* Vol. 8, Issue 1; 24A:12p, 787MB.	14963ECD-70FC-435A-B484-5D9480D0F643
ICZN	*Vasseuromys rambliensis*	2012	Ruiz-Sánchez FJ, Murelaga X, Freudenthal M, Larrasoaña JC, and Garcés M. 2012. Vasseuromys rambliensis sp. nov. (Gliridae, Mammalia) from the Ramblian (Lower Miocene) of the Tudela Formationv (Ebro basin, Spain). *Palaeontologia Electronica* 15.1.4A, 1-16.	D3E81137-B70B-487D-A84D-E25A1F78578F
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ICZN	*Vastanagama susani*	2008	Prasad GVR and Bajpai S, 2008. Agamid Lizards from the Early Eocene of Western India: Oldest Cenozoic Lizards from South Asia. *Palaeontologia Electronica* 11.1.4A:1-19	FDEE64A4-07AE-4629-BB61-7677FE112BBA
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