**Taxonomic Workflow supplement**

Within the eODP database, we created a ‘Non-taxonomic modifier’ column for taxonomically-relevant morphological and size information that is not a subspecies or standard modifier but is information that is more important than going into the ‘Comment’ field.  For example, nannoplankton species will have different size bins that are relevant for identification and specific morphologic features like the number of rays on a *Discoaster*. For planktic forams, pink and white G. ruber; dextral and sinistral; intergrades of species like “*Paragloborotalia continuosa/mayeri*”. Benthic forams, Nodosaria spp. ‘elongate forms’.  Radiolarians, intergrades like *Botryostrobus auritus-australis* group.

Some informal names were kept, like ‘Phytolith’ and ‘spore’ - as these have valid meanings and coarsening up to a formal taxonomic name would become less useful to meaningless (ex., phytolith would be coarsened up to “Plantae” and spore to “Life”).  These informal names were placed into quotes.

Lists that were mislabeled (ex., nannofossil taxa in ‘diatom’ files) were correctly assigned.

The placement of taxonomic modifiers were standardized to always precede the name; ‘?’ was sometimes attached to the end of a name. Similarly, ‘sp.’ needed to be added to many generic questionable names (ex., ‘*Arenobulimina* ?’ becomes ‘? *Arenobulimina* sp.’). The single entry dextral and sinistral foram ratios into two entries, one for each of the sinistral and dextral counts.

Homonyms were disambiguated within the PBDB; ex., *Trinacria* is both a diatom and a bivalve; *Helminthopsis* is both an ichnofossil and diatom, *Multispinula* is both a brachiopod and a dinoflagellate, *Helicolithus* is both an ichnofossil and a calcareous nannoplankton.  Note that the PBDB has a specific function for keeping homonyms separate.

**Unique modifiers**

?

aff.

cf.

f. (abbreviation for forma)

morph

sensu stricto

sensu lato

var.

Instructions for PBDB entry

Start becoming familiar with the PBDB entry features by going to:

[https://paleobiodb.org/#/resources](https://nam01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fpaleobiodb.org%2F%23%2Fresources&data=02%7C01%7Cjs4558%40drexel.edu%7Ca59a4e1cd3bf4753482a08d7f5b20139%7C3664e6fa47bd45a696708c4f080f8ca6%7C0%7C0%7C637248017175943703&sdata=o1alzAY%2FpI3wDUWPeixfQrfdEP4LX8HQ6p8nVKV9bg0%3D&reserved=0) and scroll to:

 "Data Entry Tutorials" - I think the best order to watch these in is:

 "Paleobiology Database Webinar 2: Entering Data" then

"Enter new reference" then

"Enter new taxon" and

"Enter new taxonomic opinions"

The videos about entering a reference, new taxon, and new taxonomic opinion are the most relevant; the "Entering Data" video covers all the PBDB features, so it contains much more than needed for just taxonomic entry, but is a good place to start for a general overview of the PBDB.

The first video in this series (webinar 1) is about downloading data, which is helpful in pulling taxonomy for various groups and to create stats on number of refs, names, and opinions entered  [https://www.youtube.com/watch?v=c26nKFjbH38](https://nam01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3Dc26nKFjbH38&data=02%7C01%7Cjs4558%40drexel.edu%7Ca59a4e1cd3bf4753482a08d7f5b20139%7C3664e6fa47bd45a696708c4f080f8ca6%7C0%7C0%7C637248017175953705&sdata=Rmvv8ZCdEkF9uYaEDNi0K5H4BBovoIiAfovWdG6UY5U%3D&reserved=0).

Process for entering; example here is the calcareous nannoplankton; process was followed for all the taxa we entered with databases and experts listed in Table 2:

Calcareous Nannofossils (mostly Coccolithophorids, but other groups, too) by Leah

Step 1:

We want to start out by completing the higher level taxonomy in the PBDB. For this I am going to refer to algaebase.org:

https://www.algaebase.org/browse/taxonomy/?id=4359

Kingdom through Class will be the same for all species. To see the full reference for the name, click on the Authority.

The PBDB needs to have the Kingdom (Chromista) and Class (Coccolithohyceae) updated.

Step 2:

Algaebase contains some of the orders. Use this site for what is present to the order level. Not all of the orders have an authority listed, but we will cover this below. Ignore the incertae sedis for now, we will enter those last.

Step 3:

For all other orders, orders with an authority, and lower level taxonomy, we will move to the Nannotax database:

Cenozoic and Extant: http://www.mikrotax.org/Nannotax3/index.php?dir=Coccolithophores

Mesozoic: http://www.mikrotax.org/Nannotax3/index.php?dir=Mesozoic

The linked pages list the Orders. Add any order that is either not included in the Algaebase or does not have an Authority listed in Algaebase.

To find the citation, you will need to click on the order (example: Isochrysidales). This will now list 3 families. Below the list of families you will see there is a citation (Pascher 1910).

To get to the full reference for Pascher 1910, go to “Tools” listed along the menu bar and select “References”. You can search for Pascher and get the full citation.

You can now do the same steps for the Family level.

Step 4:

After completing the families, we should download the taxonomy from the PBDB and make sure that attributions are correct (i.e. family is linked to order and not to phylum).

Step 5: Move onto genera