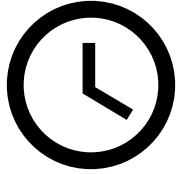




EEB C177

SELACHII DIVERSITY

Kelsey Jiang



EVOLUTIONARY HISTORY

Class: Chondrichythes

Subclass: Elasmobranchii

Superorder:
Selachimorpha (Selachii)

-Clade that includes modern species of sharks and rays

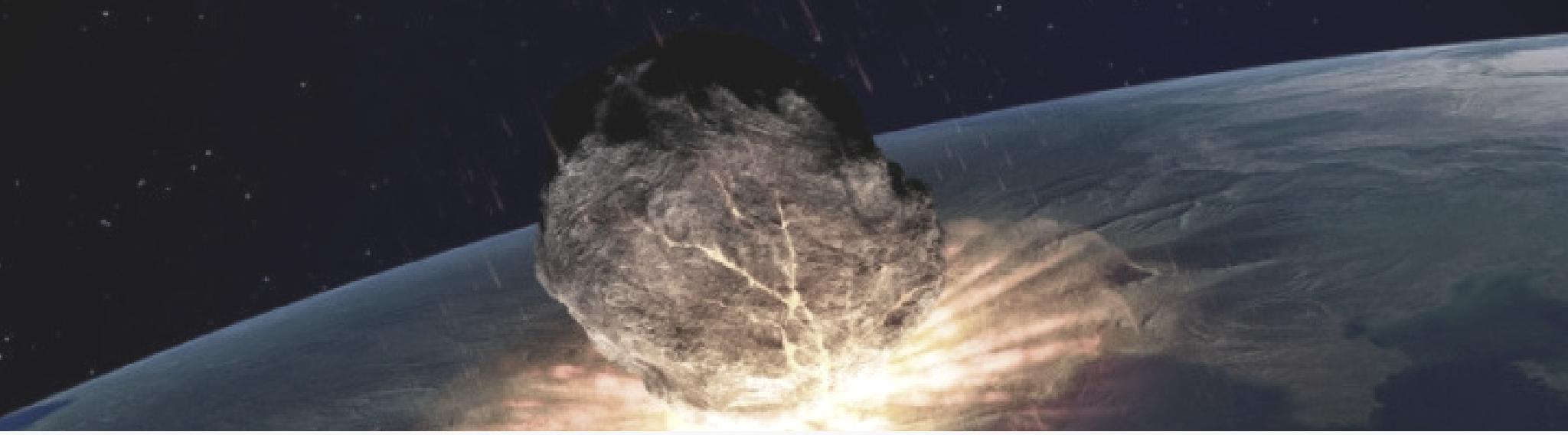
- Sharks have swum in the ocean for about 450 million years



- The oldest shark fossil discovered dates back to 455 mya during the Ordovician Period



- The fossils usually come in the form of teeth/scales because their cartilaginous frames do not fossilize easily



WHY SHARKS?

Sharks are one of the few species that have survived the past five mass extinctions.

I want to compare their extinction/speciation rates before and after each mass extinction and compare it to the supposed "sixth mass extinction" we are experiencing today due to overfishing.

**ALSO CAUSE
THEY'RE JUST
PLAIN COOL!**



Lightning Talks - Working Functions

```
In [10]: selachii_data = {}
ff = open("selachii-functions-data.csv", "r", encoding = "ISO-8859-15")
ss = ff.readlines()
for line in ss:
    selachii_species = line.split(",")[0]
    selachii_interval = line.split(",")[1]
    selachii_data[selachii_species] = selachii_interval
ff.close()

In [11]: def makeSelachiiDict(filename):
    # this function opens the data file from Elasmobranchii and extracts the species and interval
    # as a dictionary.
    SelachiiDict = {}
    fobj = open(filename, "r", encoding = "ISO-8859-15") # open the file
    all_records = fobj.readlines() [1:] # read the file, all_records is a list
    for line in all_records:
        record_elements = line.split(",")
        selachii_species = record_elements[0]
        selachii_interval = record_elements[1]
        SelachiiDict[selachii_species] = selachii_interval
    # name = line.split(",") splits it into a new list that is ordered correctly
    # split lines on comma
    # stick species and family into ElasmobranchiiDict

    return SelachiiDict

In [12]: makeSelachiiDict("selachii-functions-data.csv")

Out[12]: {'Abdounia': 'Ypresian',
 'Acanthoscyllium': 'Santonian',
 'Aetobatis irregularis': 'Ypresian',
 'Aetobatis profundus': 'Langian',
```

title	author	output
selachii-fossil-occurrences	Kelsey Jiang	html_document

```
library(ggplot2)

setwd("~/Desktop/eeb-177/EEB-177-Final-Project/Selachii-Data")
sharks <- read.csv("~/Desktop/eeb-177/EEB-177-Final-Project/Selachii-Data/selachii_ranges.csv", header = F, as.is = 1
names(sharks) <- c("genus", "species", "minage", "maxage")
head(sharks)

sharks_occ <- ggplot(sharks, aes( species, ymin = maxage, ymax = minage, colour = genus))
sharks_occ <- sharks_occ + geom_linerange()
sharks_occ <- sharks_occ + theme(legend.position = "none")
sharks_occ <- sharks_occ + coord_flip()
sharks_occ <- sharks_occ + theme(axis.text.y = element_text(size = 0.9))
sharks_occ <- sharks_occ + theme(axis.ticks.y = element_blank())
sharks_occ <- sharks_occ + scale_y_continuous(limits=c(0, 60), expand = c(0,0), breaks=c(0, 10, 20, 30, 40, 50, 60))
sharks_occ <- sharks_occ + labs(title = "Selachii Fossil Occurrences", x = "Species", y = "Ma Ago") + theme(plot.title = element_text(size = 12))
sharks_occ

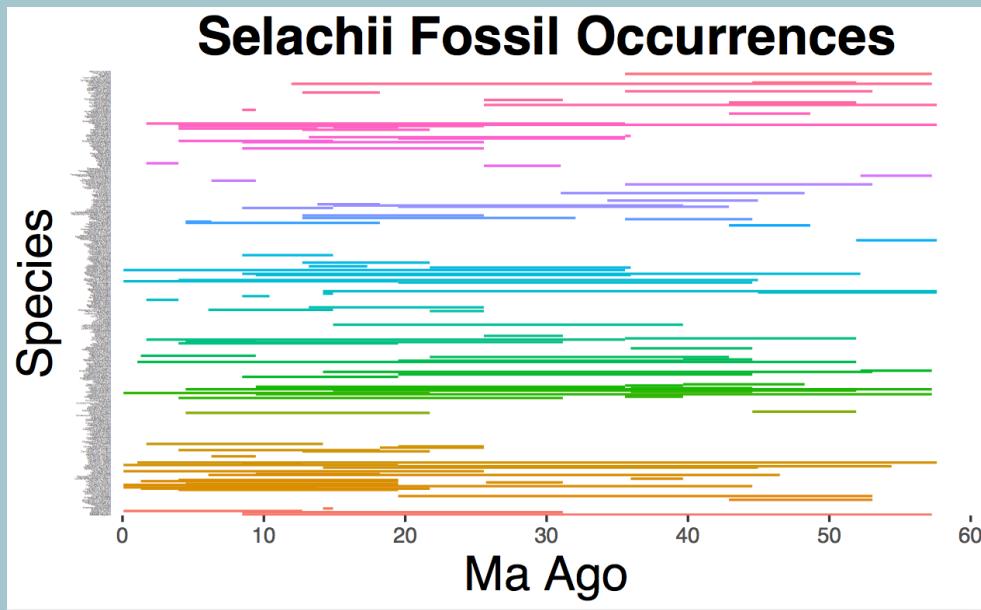
ggsave(filename = "selachii-occ.pdf", plot = sharks_occ)
```

PYTHON FUNCTIONS

Refer to Jupyter Notebook and R Studio for functions and graphs.

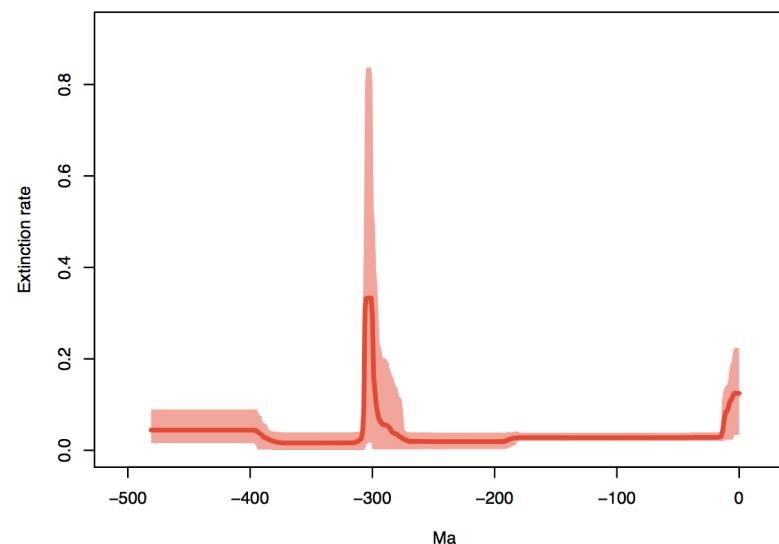
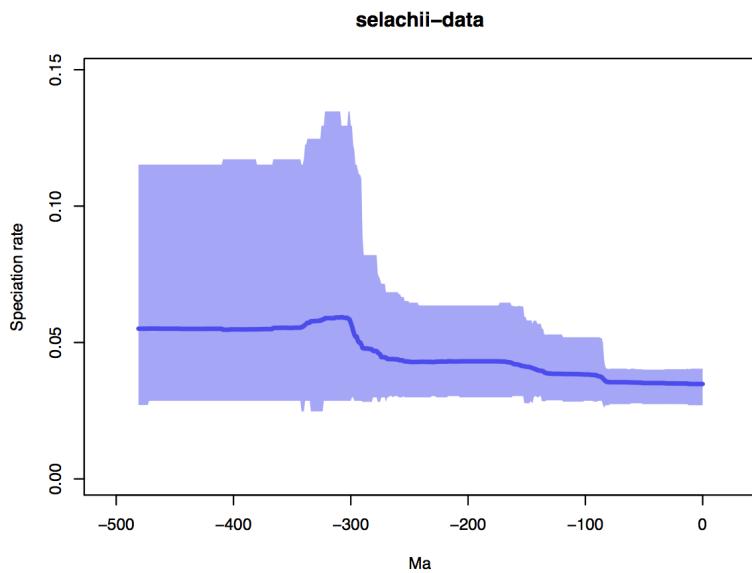


01



Fossil Occurrence & PyRate Graphs

02





Links to My

GITHUB

Git Profile: <https://github.com/kelseydjiang>

Git Repository: <https://github.com/kelseydjiang/EEB-177-Final-Project>



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