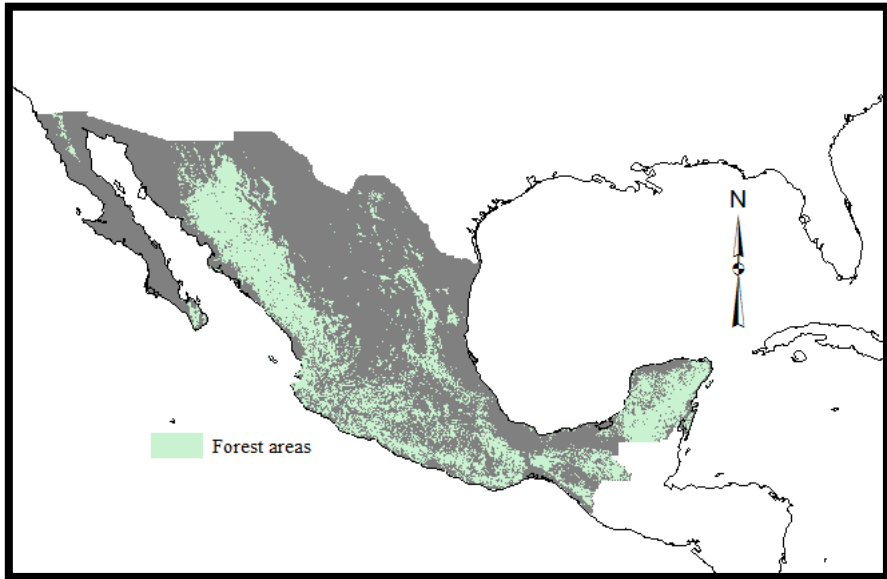


# Dendrochronological Investigations in Mexico: A review.



Andrea Acosta.

# Introduction

Mexico:

High environmental and climatic heterogeneity.

Great tradition in forestry and ecology.

Great potential for dendrochronological investigations ;)



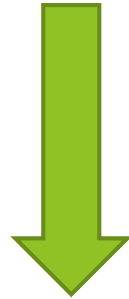
Source: <http://hidroponia.mx/la-biodiversidad-en-mexico/>



- ▶ The first dendrochronological studies of Mexico were carried out in 1944 (Schulman, 1944).

# Introduction

- ▶ We still do not know the state of the art in the country of dendrochronology and the perspectives offered by dendrosciences.
- ▶ This database would provide an overview to identify the background, knowledge gaps and trends that research has taken.



- ▶ A starting point for researchers interested in further developing dendrosciences in Mexico.



Source: <https://www.flickr.com/photos/130138082@N07/>

# Aim

- ▶ To analyze the dendrochronological investigations that have been performed in Mexican forest ecosystems, based on an exhaustive literature review to generate a diagnosis and synthesize the dendrochronological perspectives in this megadiverse country.

# Materials and Methods

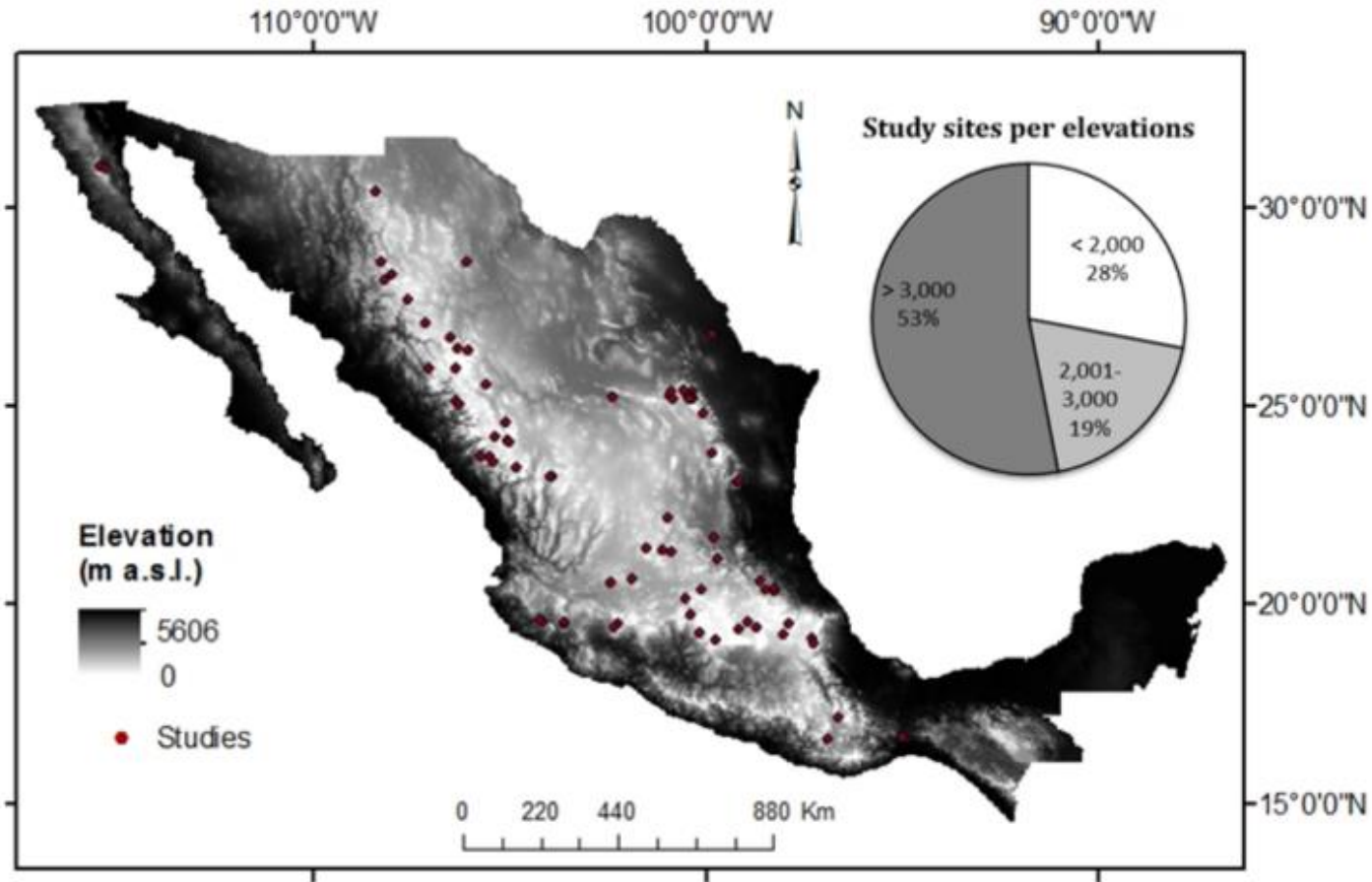
- ▶ We reviewed papers considering Mexican tree species that were published from 2001 to 2016.
- ▶ Internet searcher engines (Web of Science-Thomson, Scopus, Science Direct, Google Academic, Redalyc).
- ▶ Keywords: “dendrocronología”, “dendrochronology”, “anillos de crecimiento”, “tree rings”, “paleoclimatología”, “paleoclimatology”, “dendroclimatología”, dendroclimatology”, “dendroecología” and “dendroecology”.

# Materials and Methods

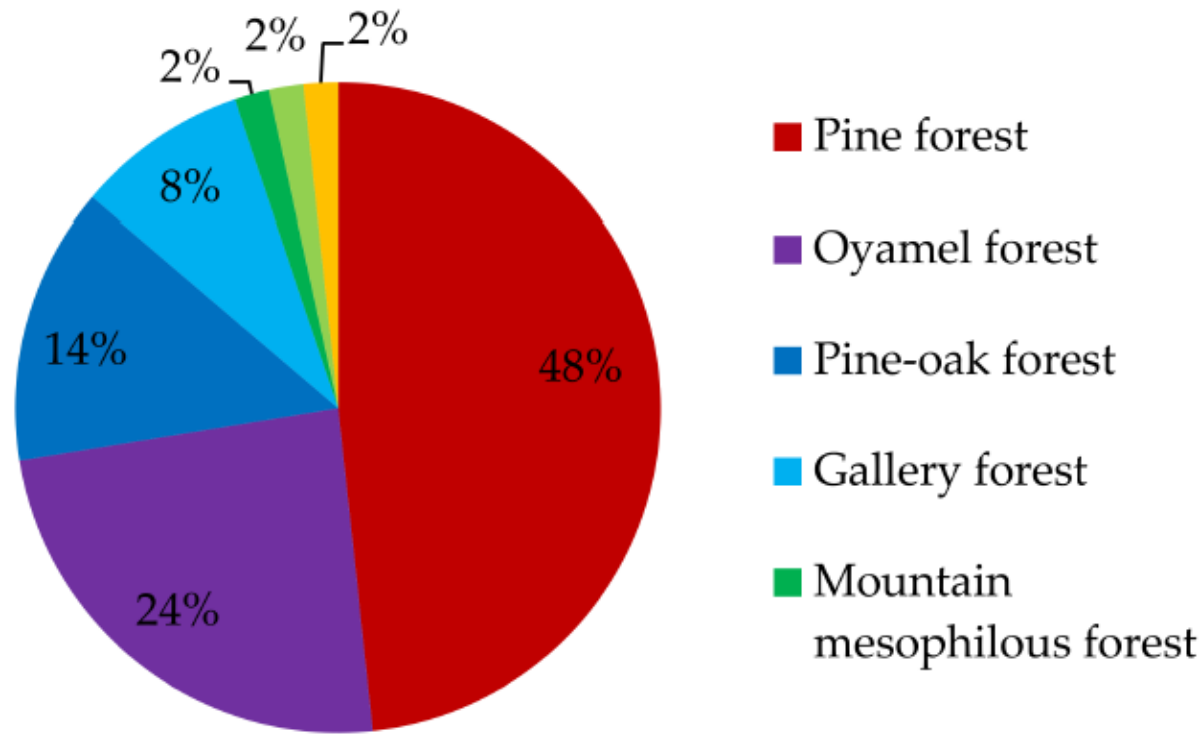
- ▶ Only included those publications that were developed in Mexico (indexed journals), avoiding grey literature (thesis, memories of congresses, technical brochures, etc.).
- ▶ A bibliographic database was built and analyzed:
  - ▶ Vegetation type.
  - ▶ Studied tree species.
  - ▶ Site data (state, geographic coordinates and altitude).
  - ▶ Study objective and scope.
  - ▶ Journal where the study was published.
  - ▶ Measured variables (tree-ring width, earlywood and latewood widths, length of the series or chronologies)
  - ▶ The institution where the investigation was conducted.



# Results

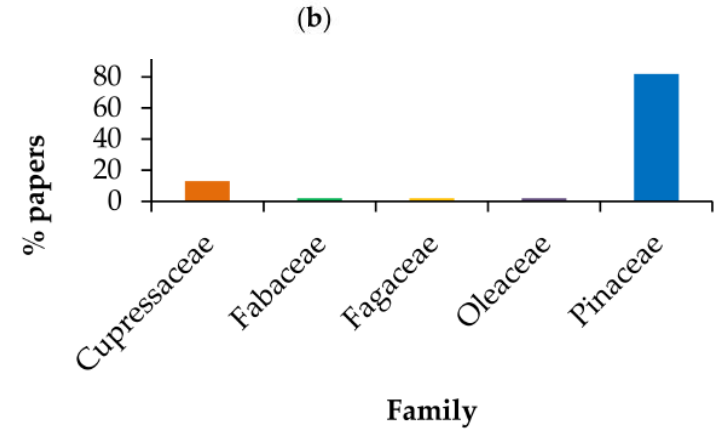
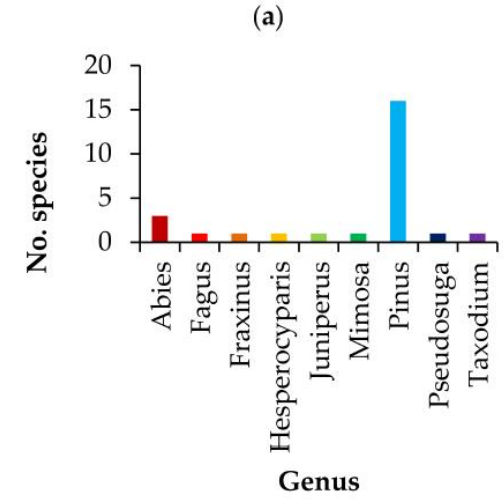
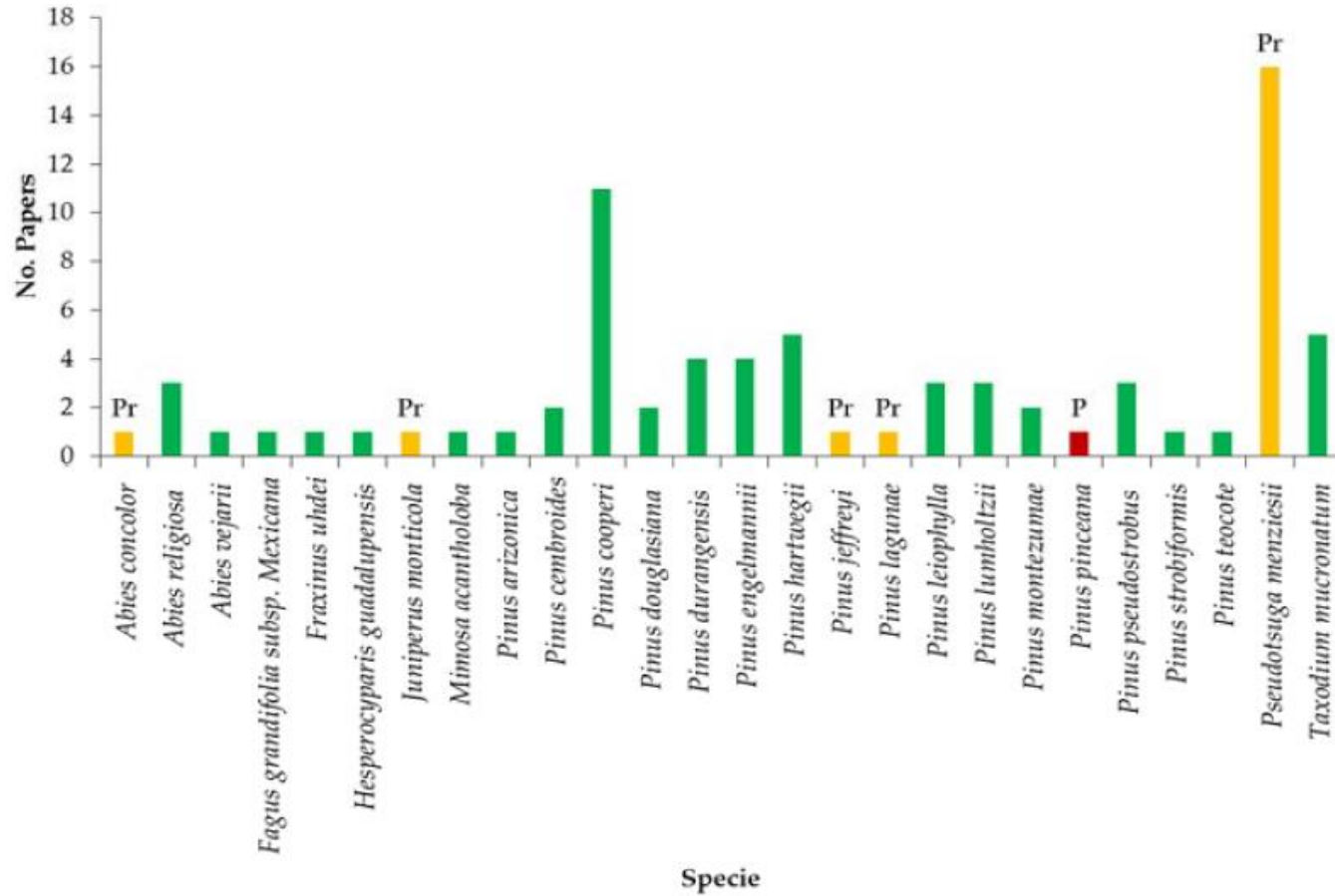


**Figure 1.** Sample sites of the dendrochronological studies carried out in Mexico. The upper right graph indicates the classification of sites based on their elevation.



**Figure 2.** Percentages of studies classified according to the type of ecosystem following the classification of the National Institute of Statistics and Geography (INEGI).





**Figure 4.** Number of dendrochronological studies carried out in Mexico grouped according to the sampled species and its conservation status. Yellow and red bars correspond to those trees species listed within a category in Mexican Official Standard 059 [28]. According to the Official Mexican Standard 059, “Pr” indicates those tree species subject to special protection and “P” indicates endangered tree species.

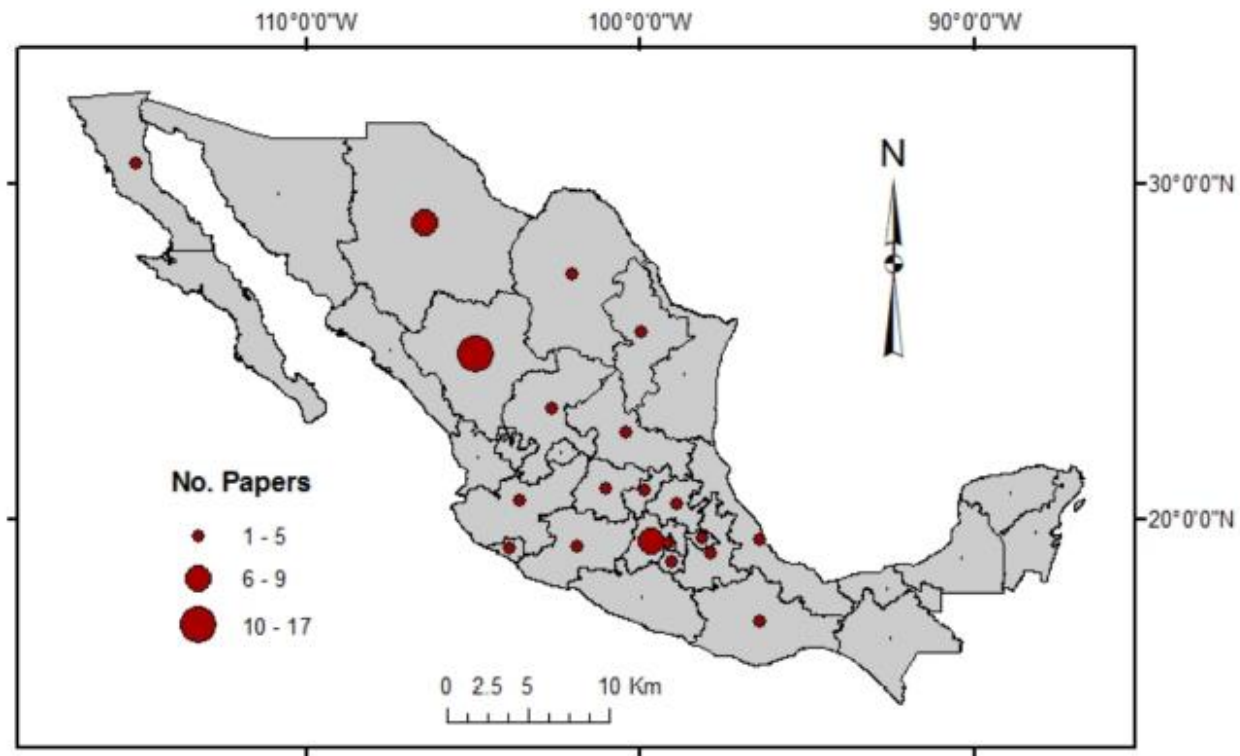
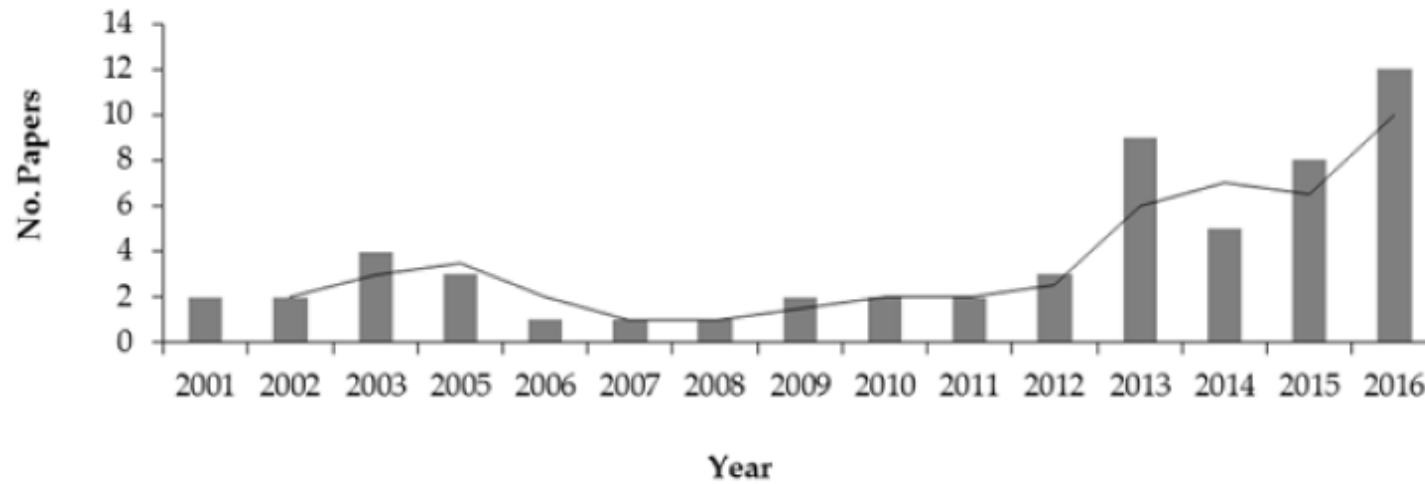
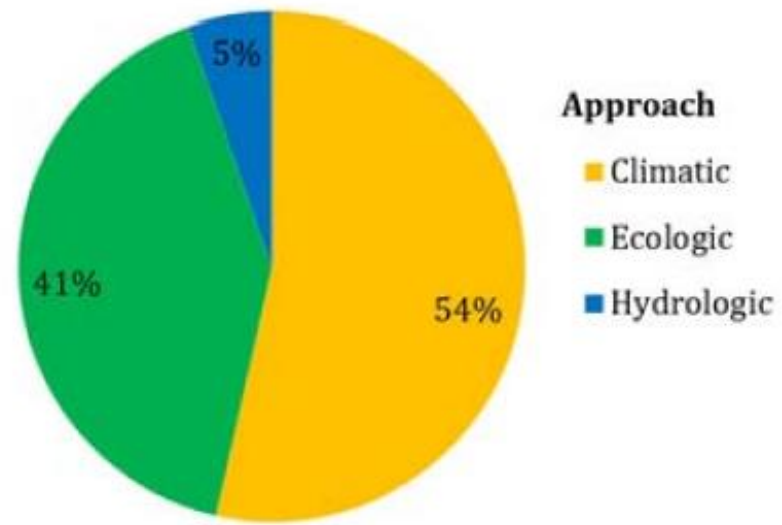


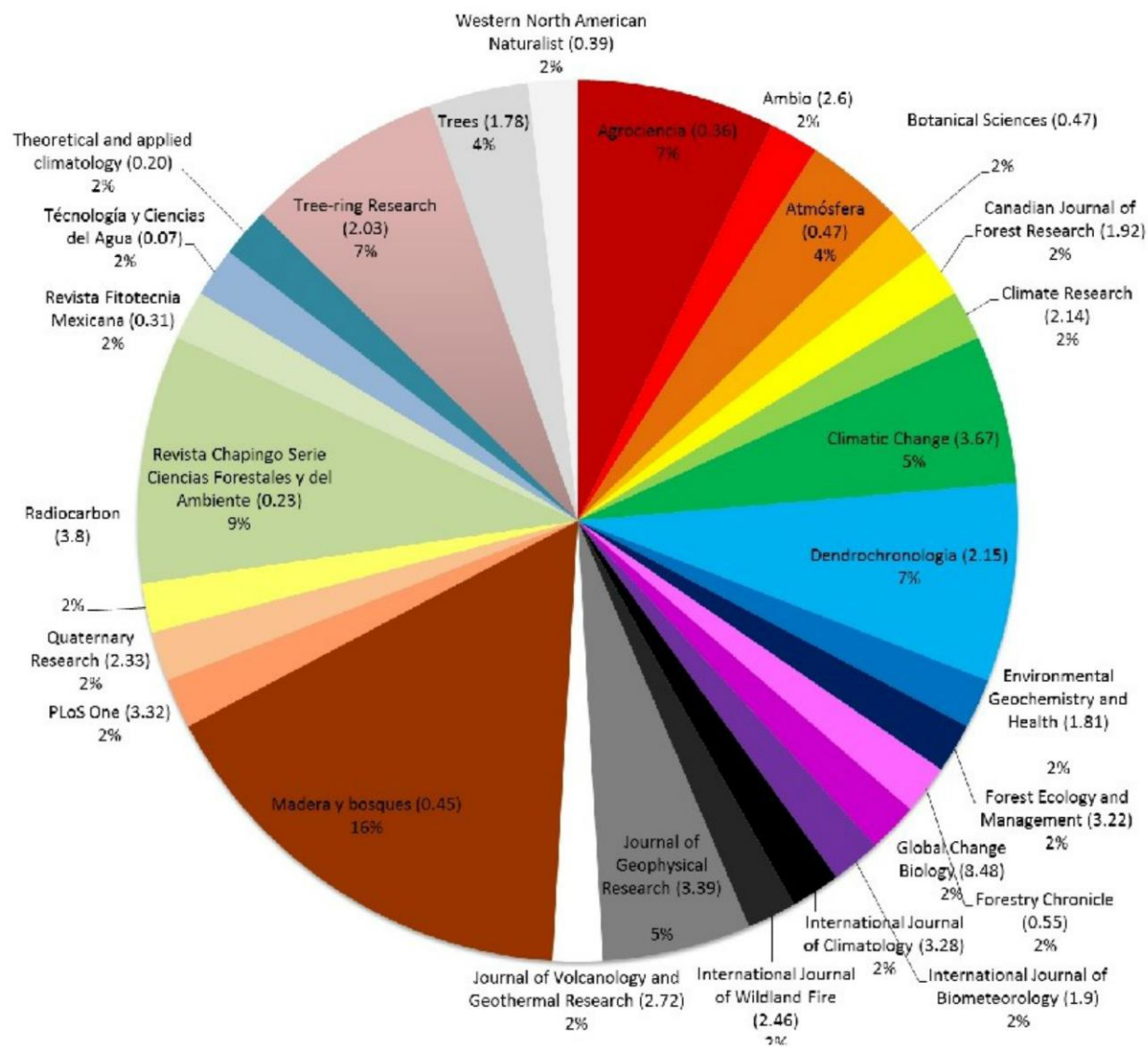
Figure 5. Dendrochronological studies performed in Mexico and grouped by states.



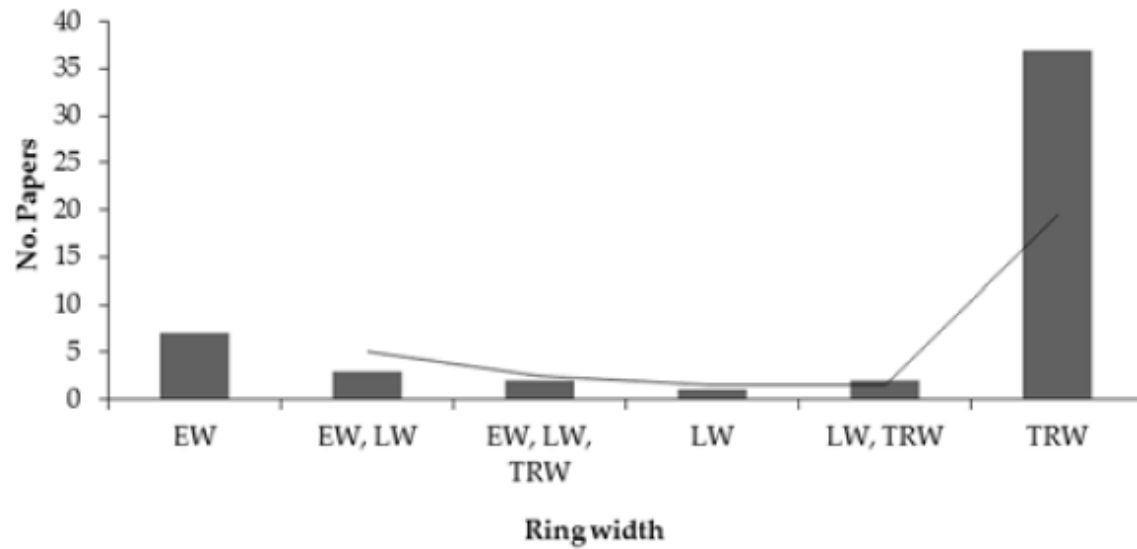
**Figure 6.** Dendrochronological studies realized in Mexico, grouped by year of publication.



**Figure 7.** Dendrochronological studies performed in Mexico and grouped by its scope of application.



**Figure 8.** Dendrochronological studies on Mexican forests grouped according to the journal where they were published. The impact factor of each journal was estimated for 2015 citation data.



**Figure 9.** Dendrochronological studies performed in Mexico considering measurements of the width of earlywood (EW), latewood (LW) and total ring width (TRW).



# Conclusions

- ▶ Conifers are the most intensively sampled tree species because of their longevity and sensitivity to climate variability.
- ▶ The reviewed studies were mostly developed for hydroclimatic reconstructions.
- ▶ Tree-ring studies were carried out in both national and foreign institutions.
- ▶ Dendrochronological studies are mostly published in international journals.

# Future need directions

- ▶ Increase research in tropical biomes.
- ▶ It may be beneficial to broaden tree-ring sciences to encompass other research fields.
- ▶ Measuring earlywood and latewood features may also contribute to improving the reach of some studies.
- ▶ Collaboration with national and international researchers is a great opportunity to promote the future development of dendrochronology in Mexico.

# Thank you i

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