

22th FEFCO

Forest Ecosystem Function Colloquium (FEFCO) は、地域や地球全体のレベルで森林生態系の機能とその持続的活用法を統合的に理解することを目的とし、研究者間の学術交流を推進します。

第22回森林生態系機能コロキウムは、フロリダ大学のFrancis E. Jack Putz先生にご講演いただきます。どなたでも参加できますので、多くの皆様のご参加をお待ちしております。京都大学農学研究科 森林・人間関係学研究室と熱帯環境学研究室がホストを務めます。

22th FEFCO

2015/6/23 16:00 - 17:30

Faculty of Agriculture Main Building, S174
Francis E. "Jack" Putz (Univ. of Florida)

VINE ECOLOGY BUILT FROM FIRST PRINCIPLES

Rather than me telling the audience what I know about the ecology of climbing plants, I want to try to "build" this ecology from basic constraints on the climbing habit. The objective is to generate ecological and other sorts of hypotheses about these plants based on what we collectively learn about their biology. For that purpose, it will help to clarify a few terms and principles (below) and for everyone to have a section of liana stem to examine (to be provided). After we've struggled with this challenge for a while, I promise to show some slides and tell some stories about these engaging plants.

1. **Lianas** are woody climbing plants whereas the word **vine** includes both woody and herbaceous species.
2. **Poiseuille's Law**: laminar flow through a tube (e.g., a xylem vessel) increases with the radius of the lumen of that tube to the fourth power.
3. **Critical Height**: the height at which a cylindrical structure of a given diameter (and taper) will collapse under its own weight.
4. A **bent** structure is **compressed** on one side and stretched (= **tensioned**) on the other--between the two is a "**neutral surface**" that does not change. **Torsion** is complex but basically involves twisting.
5. **Flexural stiffness** is a function of the elasticity of the material from which a structure is composed and its shape; note that the contribution of material to a structure's stiffness increases with the distance of that material from the neutral surface raised to the fourth power.
6. Cells in **meristematic** tissues have the capacity to divide (e.g., parenchyma).
7. **Compartmentalization**: reaction of living plant cells around wounds that constrains the spread of infections.
8. **Sapwood** contains living cells and conducting xylem vessels and tracheids, **heartwood** has neither.
9. **Prehensile apparatus**: the structures plants use to support themselves when they climb (e.g., adventitious roots, twining stems, tendrils, hooks).