From Buried Dead to Alive in Your Pocket: Moving Fossil Data from Spreadsheet to Database to Print to Mobile Phone Key APP

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Tracing the path of arthropods-flora interactions from their millions-old deposition & burial toward a live user-responsive interaction smartphone application.

Introduction
Paleobotanical specimens from the fossil record reveal the interaction of insects and plants. Our investigations have two initial endeavors: 1) to identify and morphotype the damage caused by insects on such leaves. These are our Damage Types. These Damage Types, or “DTs,” can be put into ten broad interaction groupings and are referred to as the “Functional Feeding Groups.”

Data Collection
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The Functional Feeding Groups:
- Plant Galling
- Hole Feeding
- Margin Feeding
- Leaf Mining
- Surface Feeding
- Insect Damage
- Piercing and Sucking
- Margin Feeding
- Leaf Mining
- Oviposition
- Pathogen

Examples of the different types of insect-flora interactions that can take place on a single plant (Psaronius).

Damage Types
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A typical paleobotanical specimen marked with various damage types.

The Lucid Player
The Lucid 3.6 Player is generated from the Builder and can be played on your computer. It can be packaged as a self-contained java applet and distributed to others on a CD. It can be served on-line and viewed in a browser, tablet, or smartphone.

The Lucid Builder
Using the Lucid 3.6 Builder program an array is created with the Damage Types on one axis and a list of defining characteristics on the other axis. As more damage types are discovered characters are checked off in the matrix. This provides a visual clue for refining the set of characters unique to a DT and helps to distinguish one DT from another. A character can also be weighed as to its importance. Characters that are vague or often misinterpreted can be indicated. And a choice of one set of characters can be made to restrict the choices available in another set.

Filemaker Pro Advanced
Filemaker Pro Advanced is a database tool for organizing information and establishing relationships between tables of datasets. Our database is composed of five interrelated tables.

Under the hood:
Filemaker Pro Advanced allows you to write powerful scripts for processing data and creating reports. A script was written to extract selected content from the Damage Table and combine it with images from the Fossil Photos Table and from the Modern Photos Table. The scripts can generate a variety of Damage Type booklets for distribution, sorted either by DT number or by FFG.

Data from Filemaker Pro is transferred to Lucid

Data from Excel and photos are transferred to Filemaker Pro

How the Player Works:
Box 1 presents all the available features. Box 2 are all the available DTs. Chosen features in Box 1 drop into Box 3, while DTs that are absent those features are simultaneously discarded into Box 4. What remains in Box 2 is the final, appropriate DT.

TRY IT! https://tinyurl.com/y8vxwiyo.

(But sorry, this APP is in-progress, and not yet formatted for the smartphone.)

Guide to Insect Damage Types on Compressed Plant Fossils

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