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LOUISIANA NATIVE PLANT SOCIETY

MULTIPLE ENTRY INTERACTIVE KEYS AND IMAGES AVAILABLE ON THE LSU HERBARIUM WEBSITE

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VISIT THE LSU HERBARIUM WEBSITE AND EXPLORE THE "MULTIPLE ENTRY INTERACTIVE KEYS" SECTION THAT WE HAVE BEEN DEVELOPING RECENTLY WHERE MULTIPLE ENTRY KEYS ARE NOW AVAILABLE FOR CERTAIN, OFTEN LARGE, COMPLEX GENERA, E.G. *CAREX, RHYNCHOSPORA, CYPERUS, SCLERIA, XYRIS*, AND *KYLLINGA*. THE POTENTIAL FOR USING COMPUTERS TO AID PLANT IDENTIFICATIONS HAS BEEN RECOGNIZED EVER SINCE THESE TECHNOLOGIES BECAME MORE READILY AVAILABLE (MORSE 1968; PANKHURST 1970,1971; TUTIN 1968). EARLY USE OF COMPUTERS WAS TO PRODUCE KEYS THAT WERE VERY MUCH LIKE THE HAND WRITTEN, DICHOTOMOUS KEYS USED IN FLORAS, MANUALS, AND PLANT GUIDES FOR OVER 200 YEARS. SUCH KEYS WERE NOT INTERACTIVE, AND OF COURSE, THERE WAS NO WORLD WIDE WEB OR INTERNET FOR MAKING THEM AVAILABLE. THE RATIONALE FOR USING COMPUTER TECHNOLOGY IN THIS WAY WAS TO OPTIMIZE THE COMBINATION OF CHARACTERS MOST EFFECTIVE FOR IDENTIFYING TAXA.

TRADITIONAL DICHOTOMOUS PAPER KEYS (E.G., RADFORD ET. 1968 OR GODFREY AND WOOTEN 1979, 1981) FAMILIAR TO MANY ARE VERY HELPFUL FOR THE USER WHO KNOWS THE APPROXIMATE IDENTITY OF THE PLANT IN QUESTION. THE KEY SERVES MERELY AS A REMINDER OF THE TECHNICAL FEATURES THAT DISTINGUISH AN UNKNOWN FROM OTHER SIMILAR TAXA. SUCH INITIATED USERS AND SPECIALIST HAVE DEVELOPED, THROUGH CONSIDERABLE EXPERIENCE, A COMMAND OF THE TECHNICAL TERMINOLOGY NEEDED FOR USING SUCH KEYS. FOR THE BEGINNER, HOWEVER, USE OF DICHOTOMOUS KEYS GENERALLY IS AN INTIMIDATING, OVERWHELMING, DISHEARTENING, DAUNTING, TEDIOUS, AND TIME CONSUMING ACTIVITY. THEIR USE IN COMPLEX TAXONOMIC GROUPS OFTEN CONCLUDES WITH INCORRECT RESULTS. KEY STRUCTURE AND INFORMATION CONTENT, THE NATURE OF THE UNKNOWN PLANT, AND INEXPERIENCE OF THE USER ALL CONTRIBUTE TO THE COMPLEXITY OF THIS PURSUIT WHERE THE OUTCOME IS OFTEN UNSUCCESSFUL. TRADITIONAL DICHOTOMOUS KEYS OFFER LITTLE FLEXIBILITY. FOR EXAMPLE, IF THE FIRST PAIR OF STATEMENTS REFERS TO PRESENCE OR ABSENCE OF RHIZOMES AND A SAMPLE BROUGHT FOR IDENTIFICATION LACKS UNDERGROUND PARTS, THE IDENTIFIER IS IMMEDIATELY PLACED AT A DISADVANTAGE. INFORMATION CONTENT IN DICHOTOMOUS KEYS IS OFTEN LIMITED TO A FEW CHARACTERISTICS AND THE USEFULNESS OF

MULTIPLE ENTRY INTERACTIVE KEYS OFFER SEVERAL ADVANTAGES OVER CONVENTIONAL KEYS: 1) ANY TYPE OR NUMBER OF CHARACTERS CAN BE USED IN ANY ORDER, AND THEIR VALUES CAN BE CHANGED; 2) A CORRECT IDENTIFICATION CAN BE MADE IN SPITE OF ERRORS IN THE DATA OR ONES MADE BY THE USER; 3) NUMERICAL CHARACTERS CAN BE USED DIRECTLY WITHOUT BEING DIVIDED INTO RANGES; 4) THE USER CAN EXPRESS UNCERTAINTY BY ENTERING MORE THAN ONE STATE VALUE, OR A RANGE OF NUMERICAL VALUES; 5) INTERACTIVE KEYS CAN ADVISE THE USER ON THE MOST SUITABLE CHARACTERS AT ANY STAGE OF AN IDENTIFICATION; 6) THEY CAN INFORM THE USER WHERE A DECISION WAS MADE THAT LEAD TO ERRONEOUS RESULTS, ETC. IN GENERAL, THE INFORMATION CONTENT OF INTERACTIVE KEYS IS MANY TIMES GREATER THAN CONVENTIONAL KEYS BECAUSE THE INFORMATION IS ENTERED INTO A DATA MATRIX WITH ALL CELLS FILLED. FOR THESE AND FOR MANY OTHER REASONS MULTIPLE ENTRY KEYS VASTLY IMPROVE THE SPEED AND ACCURACY FOR PLANT IDENTIFICATION, ESPECIALLY FOR COMPLEX GROUPS. MULTIPLE ENTRY INTERACTIVE KEYS SERVE A BROADER AUDIENCE BECAUSE LESS TRAINING IS REQUIRED FOR THEIR USE AND BECAUSE IMAGES, ILLUSTRATIONS, AND GLOSSARIES ARE BEING DEVELOPED TO ASSIST THE USER.

MULTIPLE ENTRY INTERACTIVE KEYS AVAILABLE ON THE LSU HERBARIUM WEBSITE (HTTP://WWW.HERBARIUM.LSU.EDU/PLANTS/) WERE DEVELOPED USING LUCID SOFTWARE AND CAN BE RUN ON ANY COMPUTER PLATFORM (HTTP://LUCIDCENTRAL.ORG/HOME/). FOR RUNNING LUCID KEYS THE USER NEED ONLY HAVE JAVA VIRTUAL MACHINE (JVM) V1.4.2 OR GREATER INSTALLED, WHICH IS A FREE DOWNLOAD. AFTER ENTERING THE LSU HERBARIUM WEBSITE, CLICK ON THE TAB FOR "INTERACTIVE KEYS" (FIG. 1). CLICKING ON THE GENUS

NAME WILL OPEN THAT PARTICULAR KEY WHERE THE CHARACTERS AND CHARACTER STATES APPEAR IN THE UPPER, LEFT-HAND QUADRANT OF THE KEY WINDOW.

SELECTING APPROPRIATE CHARACTERISTICS OR ENTERING NUMERIC DATA WILL REDUCE THE TAXA AS APPROPRIATE. USED CHARACTERS AND DISCARDED TAXA WILL APPEAR IN THE LOWER TWO WINDOWS, RESPECTIVELY. THE SCREEN SHOT SHOWS THE *SCLERIA* KEY WHERE ROUGH ACHENES HAVE BEEN SELECTED (FIG. 2). THAT FEATURE THEN MOVES TO THE LOWER WINDOW AND THE SEVEN TAXA WITH EXCLUSIVELY SMOOTH ACHENES APPEAR IN THE DISCARD WINDOW AND WILL BE ELIMINATED FROM FURTHER CONSIDERATION. THE USER WOULD CONTINUE SELECTING CHARACTERS UNTIL THE SPECIES IS IDENTIFIED. ACROSS THE TOP OF THE MULTIPLE ENTRY KEYS PAGE ARE A NUMBER OF TOOLS INCLUDING A "FIND FEATURE" SHOULD THE USER WANT TO LOCATE A PARTICULAR FEATURE PART OF THE KEY SUCH AS ACHENES; USING "SUBSETS" ONE CAN SELECT "QUANTITATIVE" FEATURES COMPARED TO "QUALITATIVE" ONES, THE WAND LOOKING ICON ALLOWS FOR SELECTING THE FEATURES THAT "BEST" SEPARATE TAXA UNDER CONSIDERATION, THE "WHY DISCARDED" TOOL IS QUITE USEFUL WHEN A TAXON IS REMOVED THAT THE USER THINKS SHOULD REMAIN. THESE TOOLS SHOULD BE EXPLORED FOR THEIR UTILITY TO REALIZE THE GREATEST BENEFIT FOR THE MULTIPLE ENTRY, ELECTRONIC KEY.

IF THE USER NEEDS INFORMATION CONCERNING TERMINOLOGY OR THE CHARACTERS THEMSELVES, WE HAVE BEGUN BUILDING ANNOTATED IMAGE LIBRARIES AND ILLUSTRATED GLOSSARIES TO HELP IN THIS REGARD. IN THE *SCLERIA* EXAMPLE CLICK ON THE IMAGES TAB, SELECT "GENUS" FROM THE DROP DOWN MENU AND ENTER *SCLERIA*, CLICK ON THE MAGNIFIER ICON AND THUMBNAILS OF ALL *SCLERIA* IMAGES WILL APPEAR. EACH THUMBNAIL IMAGE CAN BE ENLARGED. INSTALL THE "COOLIRIS VIEWER" (A FREE DOWNLOAD) FOR A CONVENIENT IMAGE GALLERY MANAGER. MANY OF THE *SCLERIA* ACHENE IMAGES ARE LABELED SO THAT THOSE UNFAMILIAR WITH THE "3-LOBED, APPRESSED HYPOGYNIUM" OF *S. MUHLENBERGII* OR THE "8-9 ROUND PAPILLOSE TUBERCLES OF THE HYPOGYNIUM" OF *SCLERIA OLIGANTHA* CAN READILY VISUALIZE THESE TECHNICAL FEATURES AND MAKE USE OF THEM FOR IDENTIFICATION PURPOSES (FIG. 3).

MULTIPLE ENTRY INTERACTIVE KEYS REPRESENT A SIGNIFICANT IMPROVEMENT IN THE EASE AND ACCURACY FOR DOING PLANT IDENTIFICATIONS FOR COMPLEX PLANT GROUPS. FUTURE GENERATIONS OF SUCH KEYS WILL CONTAIN MANY ADDITIONAL FEATURES AND REFINEMENTS. OUR GOAL IN THE LSU HERBARIUM IS TO CONTINUE TO MAKE KEYS AVAILABLE FOR MORE PLANT GENERA AND FAMILIES AND TO PROVIDE MORE IMAGES ON OUR WEBSITE. THIS IS A VERY LARGE TASK DUE TO THE LARGE NUMBER OF SPECIES. IF THERE ARE VOLUNTEERS WHO WOULD LIKE TO CONTRIBUTE TO THIS EFFORT BY PROVIDING IMAGES OR ASSISTING IN KEY PRODUCTION, PLEASE CONTACT US. FEEDBACK OF ANY SORT WOULD BE WELCOME ESPECIALLY IF ERRORS ARE FOUND.

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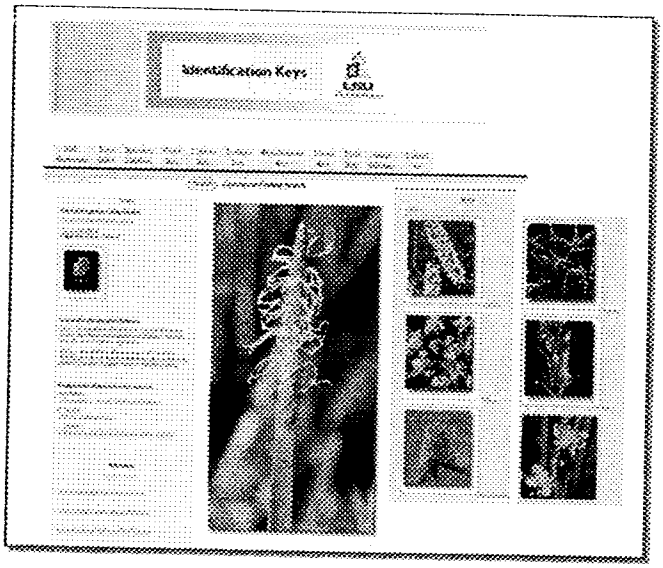

FIGURE 1. SCREEN SHOT OF IDENTIFICATION KEYS PAGE FROM THE LSU HERBARIUM WEBSITE

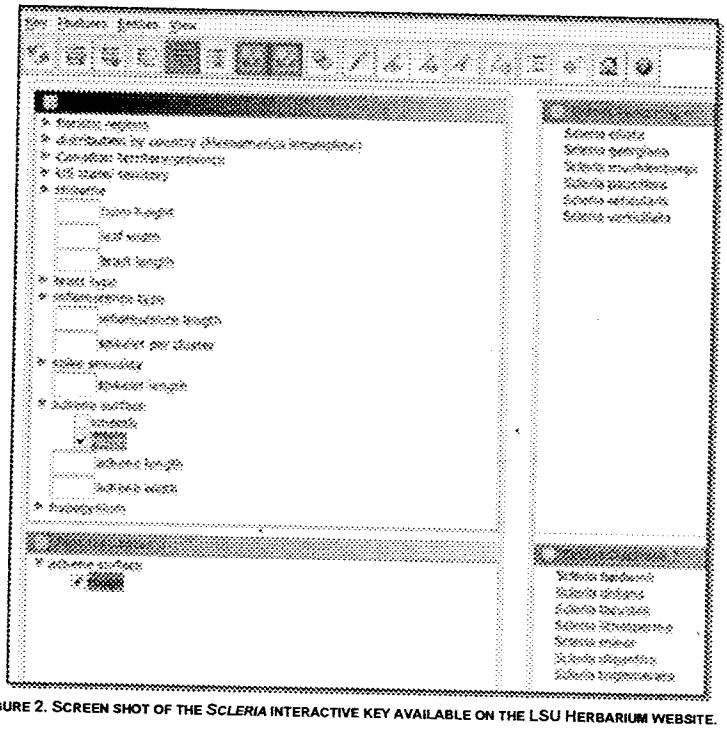

FIGURE 2. SCREEN SHOT OF THE *SCLERIA* INTERACTIVE KEY AVAILABLE ON THE LSU HERBARIUM WEBSITE.

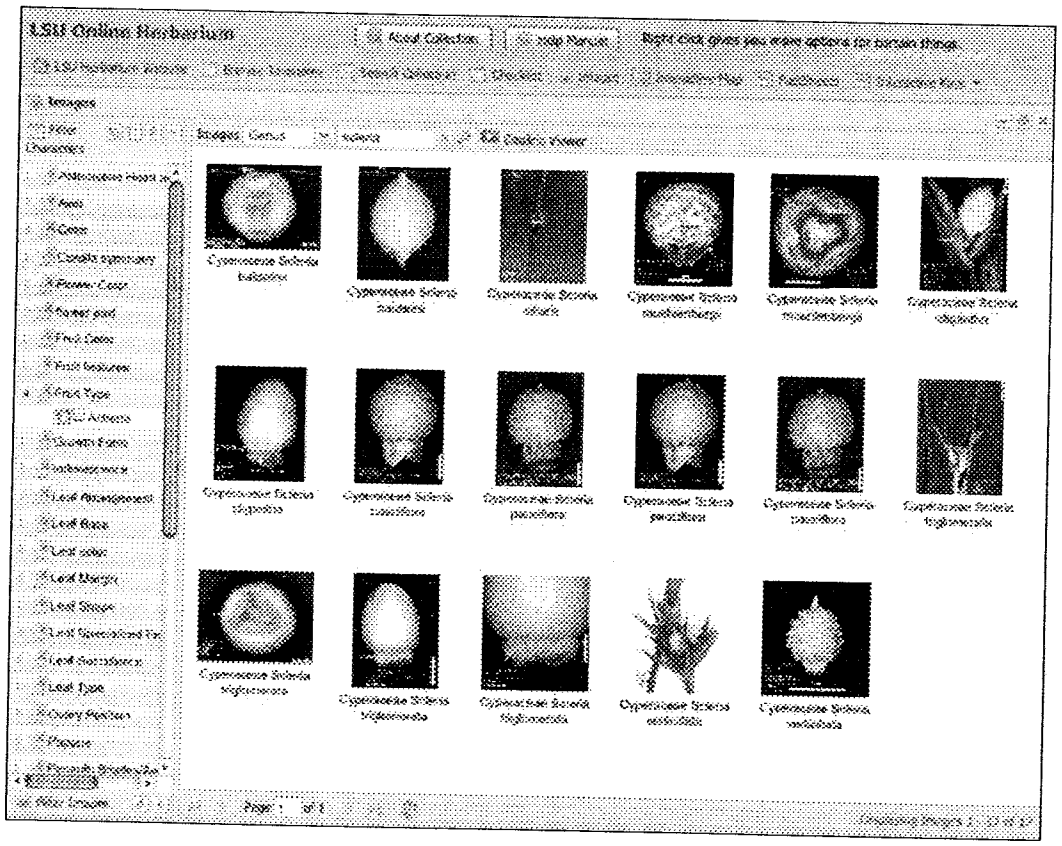

FIGURE 3. SCREEN SHOT OF THE *SCLERIA* , AVAILABLE ON THE LSU HERBARIUM WEBS

SEEDS, SEEDS, AND SEEDS

BY CHARLES ALLEN

THESE ARE MY THOUGHTS ON THE PLANTING OF NATIVE PLANT SEEDS OR ANY SEEDS. FIRST, THE TWO MAJOR GROUPS OF PLANTS ARE THE ANNUALS AND PERENNIALS. ANNUALS LIVE FOR ONE YEAR AND PRODUCE SEEDS BEFORE THE END OF THE SEASON. THE PLANT THEN DIES AND THE SEEDS ARE THE LINK BETWEEN THIS PLANT AND THE NEXT GENERATION. MOST ANNUALS PRODUCE MANY AND MANY VIABLE SEEDS SO PLANTING ANNUALS IS USUALLY EASIER THAN PERENNIALS. NOTE THAT ONCE THE SEEDS ARE PRODUCED, THE PLANT WILL DIE AND KILLING THE ORIGINAL PLANT HAS NO EFFECT. THERE IS A NOTE THAT KILLING AN ANNUAL AFTER THE SEEDS ARE PRODUCED IS LIKE MURDERING A MAN WHO IS COMMITTING SUICIDE. PERENNIALS LIVE FOR MORE THAN TWO YEARS AND OFTEN RELY MORE ON NON-SEED REPRODUCTION FOR PRODUCING NEW PLANTS. THE ABOVE GROUND STEMS DIE DURING THE WINTER BUT THE BELOW GROUND PARTS, THE RHIZOME, TUBER, BULB, CORM, CROWN, ETC., SURVIVE DURING THE WINTER AND THE NEXT SPRING, A NEW PLANT (ACTUALLY THE SAME GENETIC PLANT) SPROUTS FROM THE UNDERGROUND PART. THUS THIS IS REPRODUCTION VIA NON-SEEDS. IF THE UNDERGROUND PART GETS BROKEN INTO TWO PARTS, THEN THERE WILL BE TWO PLANTS THE NEXT SPRING. WE OFTEN TAKE THESE UNDERGROUND PARTS, FOR EXAMPLE IRISH POTATO TUBERS, AND DIVIDE THEM INTO SEVERAL PIECES WHICH WE PLANT AND THUS HAVE SEVERAL NEW PLANTS. DURING THE GROWING SEASON, YOU COULD TAKE CUTTINGS FROM YOUR PERENNIAL PLANTS AND ROOT THEM AND THEN YOU WILL ALSO HAVE NEW PLANTS. PERENNIALS CAN PRODUCE SEEDS ALSO BUT DO NOT HAVE TO RELY 100% ON THIS METHOD AND THE PERCENTAGE OF VIABLE SEEDS AMONG PERENNIALS IS OFTEN LOW.

NOW HERE ARE SOME OF MY THOUGHT ON THE PLANTING OF SEEDS. FIRST REMEMBER THAT THE WILD COLLECTED NATIVE SEEDS ARE GOING TO HAVE A LOW GERMINATION PERCENTAGE. DON'T EXPECT THE SAME KIND OF GERMINATION THAT YOU GET FROM VEGETABLE OR FLOWER SEEDS THAT YOU BUY FROM WALMART. THOSE SEEDS HAVE BEEN PROSTITUTED OVER THE YEARS; THEY HAVE UNDERGONE SELECTION SO THAT ALMOST ALL OF THE PLANTS ARE EXACTLY ALIKE AND OF COURSE, HAVE A RELIABLE AND HIGH SEED GERMINATION PERCENTAGE. THE NATIVE SEEDS, ON THE OTHER HAND, ARE STRAIGHT FROM THE WILD, AND THUS HAVE A LOW GERMINATION PERCENT, ESPECIALLY THE PERENNIALS. A SECOND THING TO REMEMBER IS THAT THE SEEDS IN THE WILD FALL TO THE GROUND OFTEN MIXED WITH THE FRUIT, FLOWER, LEAF, STEM, ETC MATERIAL FROM THE PARENT PLANT. AND THE SEEDS MOSTLY FALL IN THE FALL OF THE YEAR IN NATURE. YOU ARE SAYING WHERE IS HE GOING WITH THIS? WHAT I THINK IS THAT (1) NATIVE SEEDS SHOULD BE PLANTED IN THE FALL OF THE YEAR AS WOULD HAVE HAPPENED IN NATURE. IF YOU CAN'T PLANT THEM IN THE FALL, THEN PLANT THEM AS SOON AS POSSIBLE BUT NO LATER THAN THE END OF APRIL. IF APRIL HAS COME AND GONE AND YOU HAVEN'T PLANTED YOUR SEEDS, I WOULD PUT THEM IN THE REFRIGERATOR AND WAIT UNTIL THE FALL. AND (2) NATIVE SEEDS SHOULD BE PLANTED WITH THE MATERIAL THAT CAME WITH THE SEEDS, THE FRUIT, THE PETALS, THE LEAVES ETC. I HOPE TO TEST THIS THEORY BUT IT IS MY BELIEF THAT SEEDS GERMINATE BETTER IF PLANTED WITH SOME OF THE FRUIT, FLOWER, LEAF, ETC. MATERIAL. THIS COULD BE LINKED TO CHEMICALS IN THE MATERIAL, OR FUNGI SPORES, OR? AND (3), I LIKE TO PLANT MY NATIVE SEEDS IN GOOD SOIL AND CONTROL THE ENVIRONMENT SINCE THE GERMINATION PERCENT IS PROBABLY LOW.

THIS IS WHAT I DO: I SOAK THE SEEDS OVERNIGHT AND THEN PLANT THEM IN GOOD POTTING SOIL IN POTS OR TRAYS. I LIKE TO USE THE ALUMINUM TRAYS THAT ARE SOLD FOR BAKING TURKEYS ETC AND I PUNCH DRAINAGE HOLES IN THE BOTTOM. YOU CAN BUY NEW TRAYS BUT YOU COULD ALSO USE USED UGLY TRAYS. I ALSO RECYCLE OLD POTS AND SKILLETS AND PLANT INTO THOSE AFTER DRILLING HOLES IN THE BOTTOM UNLESS THE POT IS SO OLD THAT THERE ARE ENOUGH DRAINAGE HOLES ALREADY. I LABEL THE TRAYS OR POTS USING A MARKS A LOT OR PENCIL ON WHITE PLASTIC LABELS. YOU COULD BUY WHITE PLASTIC LABELS OR TAKE YOUR OLD CHLOROX BOTTLES OR OTHER PLASTIC BOTTLES AND CUT THEM INTO YOUR OWN LABELS. I USUALLY FILL THE TRAYS ABOUT 2/3'S FULL WITH SOIL AND PACK THE SOIL DOWN A LITTLE. THEN I SPREAD OUT THE SEEDS ON TOP OF THE SOIL. THEN I GENTLY ADD ANOTHER1/4 TO ½ INCH OF SOIL ON TOP OF THE SEEDS. THE GENERAL RULE OF THUMB IS THE SEED SHOULD BE PLANTED AS DEEP AS IT IS THICK. AFTER PLANTING, I PLACE THE POTS ON THE GROUND IN A SHADE TO PARTIAL SHADE SPOT. BE SURE THE BOTTOM OF THE POT OR TRAY IS IN CONTACT WITH THE SOIL.

WATER THE POTS OR TRAYS PERIODICALLY AND BE PATIENT. YOU WILL GET SEEDS TO GERMINATE IN THE POTS/TRAYS BUT IN SOME CASE IT MIGHT BE QUITE AWHILE AND IN SOME CASES IT WILL NOT BE WHAT YOU PLANTED BUT WEEDS WHOSE SEEDS GOT INTO THE POTS. I HAVE SEEN GERMINATION IN A FEW DAYS TO A FEW YEARS.

I SUGGESTED THIS METHOD TO A FRIEND AND SHE CAME BACK TO TELL ME THAT THE SEEDS WERE GERMINATING AND EACH TIME THAT SHE SAW A TRAY WITH SEEDLINGS, SHE THOUGHT OF ME.

IF YOU HAVE OTHER SUGGESTIONS, PLEASE SEND THEM TO ME. AND, IF YOU TRY THIS METHOD, LET ME KNOW YOUR RESULTS.

ULM RECEIVES ALMOST $500,000 FOR "CYBERFLORA LOUISIANA" PROJECT

BY DR. TOM SASEK

THE NATIONAL SCIENCE FOUNDATION ANNOUNCED A TOTAL AWARD OF ALMOST $500,000 TO THE UNIVERSITY OF LOUISIANA AT MONROE FOR A THREE-YEAR PROJECT THAT WILL DIGITIZE THE IMAGES AND DATA OF MORE THAN ONE MILLION PLANT SPECIMENS IN ALL 15 LOUISIANA HERBARIA. THE PROJECT, "CYBERFLORA LOUISIANA," WILL BE HEADED BY ASSOCIATE PROFESSOR OF BIOLOGY THOMAS SASEK, AND IS ONE OF THE FIRST STATEWIDE PROJECTS OF ITS KIND; CYBERFLORA LOUISIANA WILL SERVE AS A MODEL FOR OTHER STATE NETWORKS.

NEW SOFTWARE AND CUTTING-EDGE TECHNOLOGY HAS OPENED UP THE POSSIBILITY OF COLLECTING THE INFORMATION, AND INCLUDES PLANS TO DEVELOP AN ELECTRONIC STATEWIDE DATABASE FEATURING ALL OF THE 1.1-MILLION PLANT SPECIMENS IN LOUISIANA, OF WHICH 475,000 ARE HOUSED AT THE ULM MUSEUM OF NATURAL HISTORY. "CERTAINLY OUR PRIMARY FOCUS IN DEVELOPING A STATEWIDE DATABASE WAS FOR THE SCIENTIFIC COMMUNITY," SAID SASEK. "BUT WE WOULD ALSO LIKE TO ENCOURAGE TEACHERS AND THEIR STUDENTS TO UTILIZE THE DATABASE AS AN EDUCATIONAL TOOL."

THE DIGITIZED IMAGES AND DATA WILL BE FREELY AVAILABLE THROUGH A CENTRAL WEBSITE THAT, ONCE COMPLETED, WILL OFFER FAST DATA SORTING AND FILTERING, RAPID DELIVERY OF IMAGES, MAPPING OF SPECIMEN LOCATIONS, AND CHECKLISTS OF PLANTS FOR PARTICULAR LOCATIONS, SAID SASEK. THE WEBSITE WILL ALSO FEATURE DIGITAL IMAGES OF LIVE PLANTS, PLANT PARTS, AND IDENTIFYING FEATURES FOR SPECIES FOUND IN LOUISIANA, ACCORDING TO SASEK, WHO ADDED THAT VISUAL IDENTIFICATION KEYS WILL BE DEVELOPED TO AID THE GENERAL PUBLIC UNFAMILIAR WITH SCIENTIFIC TERMINOLOGY.

BESIDES THE HERBARIUM IMAGING, WE WILL HAVE A STATE WEBSITE FOR BOTANICAL INFORMATION. I'M HOPING THIS WILL GROW TO INCLUDE ALL SORTS OF INFORMATION THAT WILL BE OF INTEREST TO THE GENERAL PUBLIC. ONCE THE SITE IS UP AND RUNNING, MAYBE WE CAN SEE IF THE LNPS WOULD LIKE TO GET INVOLVED OFFICIALLY OR UNOFFICIALLY?

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