Literature Review

By Don Schnell

Cresswell, J. E. 1991. Capture rates and composition of insect prey of the pitcher plant *Sarracenia purpurea*. Am. Midl. Nat. 125:1-9.

In a sphagnum kettle bog of southern lower Michigan, the author studied prey capture by *S. purpurea* by monitoring prey every few days in 214 pitchers for a total of 55 days. During that time there was a total of 504 prey individuals from 49 families and 13 orders, 71% being *Diptera*. Interestingly, 50 % of the pitchers caught nothing and 66% of the total biomass was found in 8% of the pitchers. Some of the pitchers were periodically obstructed by spider webs which may have been a factor in decreased capture. Prior to studying any pitchers in a quadrat, the pitchers were washed of any accumulated prey, partially plugged with cotton in their depths to prevent prey from disappearing from sight in the acute curve at the base of the pitcher, and fluid was replaced with distilled water.

(Ed. Note: This study has several problems. First, it was not begun until 15 August of the study year season! In Michigan, this is nearing the end of prime pitcher capture activity. An earlier season start with inclusion of young pitchers (and indeed, comparing aged with new spring pitchers) might have been more useful. Also, it would be more helpful to relate the 214 pitchers to actual numbers of plants so that one might estimate what each plant was doing. Finally, one might seriously question the cotton plugging/distilled water manipulation of pitchers, especially if they were inspected only every 5 days. There are several other problems, but these are some of the primary ones.)

Determann, Ron. 1991. Rescuing endangered species. Clippings (Atlanta Botanical Garden members' newsletter) 14:1,6.

Readers will recall a recent review in CPN on the efforts of Ron Determann, the Atlanta Botanical Garden and Georgia officials to conserve botanical areas, and importantly, a plan for species recovery. The main thrust for this is Ron who is the Superintendent of the Fuqua Conservatory at the Garden and a CP enthusiast. As a comparative example of inaction vs. action, the US Fish and Wildlife Service has for about fifteen years been trying to come up with a recovery plan for *Sarracenia oreophylla*. To date, nothing practical has emerged, and indeed "conserved" sites continue to mostly deteriorate, although there are plenty of quadrat count markers! In about three years, the group in Georgia has come up with its own recovery plans, and they are already in action.

The cover of the newsletter (page 1) features fine black and white photos of *Sarracenia purpurea ssp. venosa* (occurs in very few locations in northeast Georgia—American CP enthusiasts will recall the "Georgia break" in the species range maps), seedlings of *S. oreophylla* (recently found in extreme northeast Georgia and immediately adjacent North Carolina), and plants of a *S. rubra* (probably ssp. *gulfensis*) recently found along the fall line in Georgia just south of Macon. The interior text page describes what is being done with each of these species. *S. oreophylla* has been increased to 1000 plants in pots and the plan is to introduce these into protected sites. *S. purpurea* is ready for expansion of recently reclaimed sites. *S. rubra* is rare in the new location, there being as few as four plants in one location. In October, 400 one year old seedlings (the plant grows very rapidly in cultivation) were planted in one location with full cooperation of the landowner, which will help with security.

Gibson, T. C. 1991. Differential escape of insects from carnivorous plant traps. Am. Midl. Nat. 125:55-62.

This paper was derived from some of the author's PhD candidate research in 1975

and compiled in his doctoral dissertation of 1983. In a hillside seep near Crestview, Florida, insect capture and escape were noted particularly in *Pinguicula lutea* and *Drosera filiformis* var. *tracyi*, although some other species are mentioned peripherally. Observations and statistical analysis and presentation indicate that body size thresholds were 5 mm and 10 mm respectively before escapes were usual. From these data, the author proposes that there is a positive evolutionary pressure for ever larger trap species in order to retain larger prey from the environment, resulting in a CP environment in larger, multiple species CP bogs (e.g. Gulf coast) that is quite diverse.

(Ed. note: At one point the author postulates or implies that *Dionaea* with its strong, active trap may have evolved and adapted due to its ability to capture larger prey. Noting the threshold size of about 1 cm for *D. filiformis* var. *tracyi*, those of us experienced in growing and observing *Dionaea* know that prey that approaches 1 cm, let alone larger, most often results in death of the trap leaf before absorption could take place, hardly an adaptive competitive feature there. One other point: The author implies a persistent assumption here (stated overtly in his original dissertation) that there is prey selection stress in a CP bog and that different pitcher and other trap morphologies are a good mix to take advantage of the entire insect buffet, as it were, that is present. But there is no attempt to enumerate [with controls!] and analyze the potential prey fauna abroad to see if there is truly a fall in various prey numbers that might stress plants through decreased capture ratios; and seasonality of new pitchers, insect populations, etc., are not well accounted for.

Prankevicius, A. B. and D. M. Cameron. 1989. Free-living dinitrogen-fixing bacteria in the leaf of the northern pitcher plant (*Sarracenia purpurea* L.). Naturaliste Can. 116:245-249.

In a bog of *S. purpurea* in Ontario, the researchers cultured the contents of pitchers from several plants and among other organisms were able to isolate three bacterial species capable of dinitrogen fixation. The authors postulate this as another source of nitrogen compounds captured from elemental nitrogen in the atmosphere, as it were. As a control, they also cultured air samples and the very low level of the same organisms indicated more than passive inoculation in the pitcher leaves. ((Ed. Note: It might have been helpful if they had also cultured the bog soil/moss, and possibly leaf surfaces of other non-CP plants.)

The 1991 List Of CP Books

Not available through CPN. Order directly from publisher, your local bookshop or C.P. Nursery.

☆ = Books intended primarily for children.
❑ = Books out-of-print.

☆❑ 1. Animals & Plants that Trap by Phillip Goldstein. Holiday, 1974; Holiday House, Inc.: 18 E. 53rd St.; New York, NY 10022. $5.95.

2. Carnivorous Plants by Gordon Cheers. Globe Press. Melbourne. (ISBN 0-9591937-0-7) International Spec. Books. See #9 for address. $9.95

3. Carnivorous Plants by Francis E. Lloyd. Peter Smith; 6 Lexington Ave., Magnolia, MA 01930; USA. 1942 ed. Paper $7.95. (ISBN 0-486-23321-9)

4. Carnivorous Plants by Randall Schwartz. Avon Books, 1975; 959 Eighth Ave.; New York, NY 10019; USA. Soft cover $1.25 (ISBN 0-275-51580-X)