Hand Pollination of Rare Triggerplant Successful

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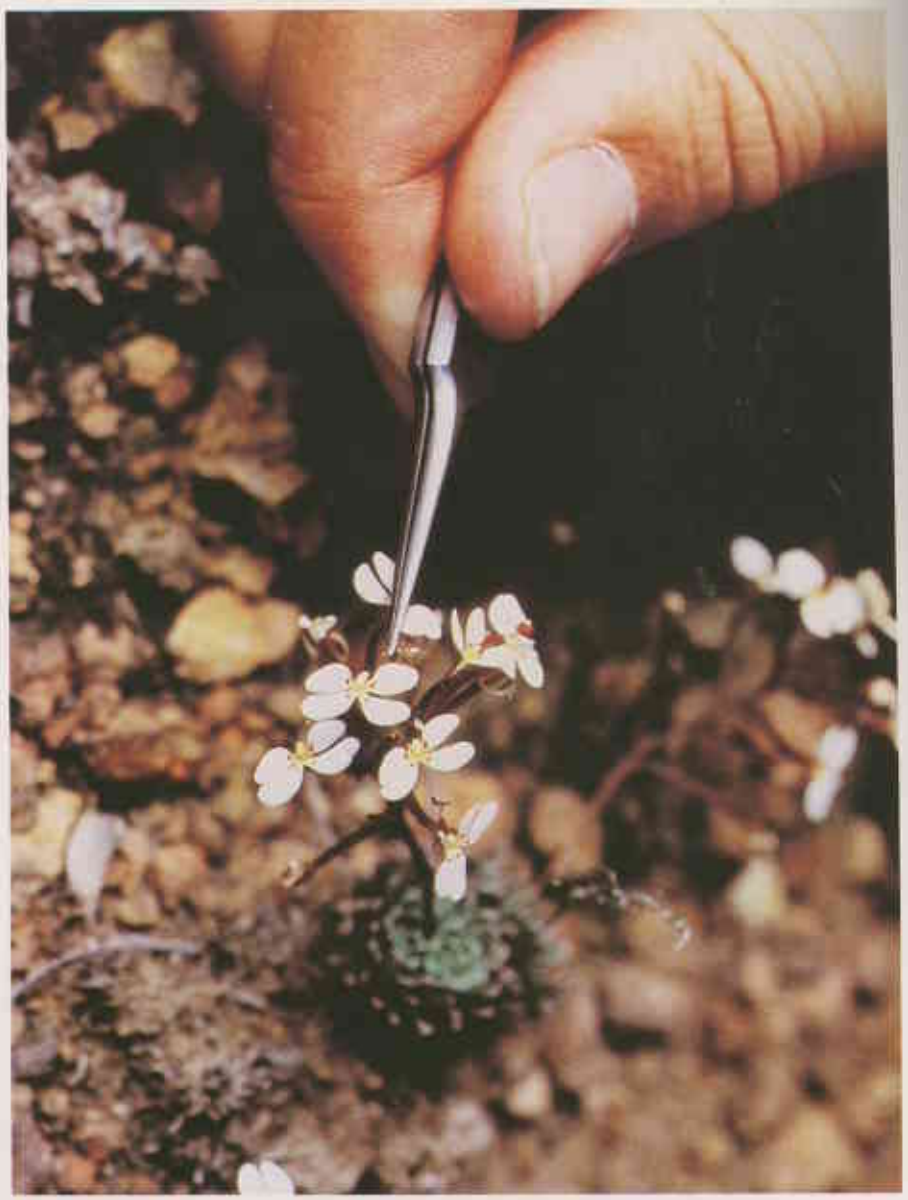
The Wongan Triggerplant *Stylidium coroniforme* is one of Western Australia's rarest wildflowers. Only two plants are known to exist and these occur in a small fenced enclosure on the edge of a sheep paddock near Wongan Hills, a sheep and wheat farming district 150 km north-east of Perth.

The triggerplant was named in 1966 by Dr Rica Erickson and Mr Jim Willis from specimens collected in 1963 at the same locality where it is found today. At that time the species was reported to be abundant. It has declined to just two plants presumably because of a combination of grazing and trampling by sheep, erosion of topsoil and several successive years of drought.

Attention to the plight of the species was drawn in 1979 by two publications on rare plants. The need for more information on its conservation status was then recognised by the Department of Fisheries and Wildlife, and money was made available for a consultant botanist to search the Wongan Hills for this and other rare plants. Dr Barbara Rye undertook the job in August-October 1980. She failed to locate Wongan Triggerplants anywhere else but at the original place where Dr Erickson and Mr Willis made their collection. Moreover, only one plant was present when Dr Rye searched the area.



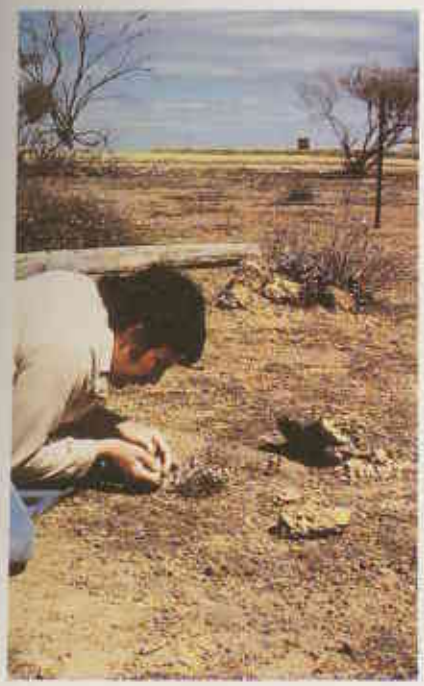
▲ Pollen held in forceps is rubbed on the stigma of the Triggerplant's flowers. (Photo P. Roberts.)

Although this plant produced a good crop of flowers, it failed to set any seed in 1980. Like many other triggerplants *Stylidium coroniforme* appears to require cross-pollination between separate plants to set seed.

Following an inspection of the triggerplant site in November, 1980 by Dr Rye, Chief Research Officer Dr Andrew Burbidge, Technical Officer Mr Phil Fuller and myself, a fence was erected in April, 1981 to exclude sheep and allow any seed that germinated a chance to grow undisturbed to maturity.

On September 16, 1981 the Wongan Hills District Wildlife Officer Phil Roberts discovered a second plant of *Stylidium coroniforme* within the enclosure. It had produced three rosettes of leaves from an old woody groundstock that presumably was dormant during the 1980 season. No seedlings were observed within the enclosure.

Hence it was decided to hand-pollinate flowers on the two existing plants in the hope of obtaining seeds and germinating the species in cultivation. Advice on the best procedure was sought from Dr Sid James of the Botany Department, University of Western Australia, as he and his students had made detailed studies on the reproductive biology and evolution of triggerplants.



▲ Wildlife Officer Phil Roberts performs the operation. Note the fence erected to exclude sheep and the poor soil in which the plants were found. (Photo S. D. Hopper.)

Armed with preliminary information from Dr James, I accompanied Wildlife Officer Roberts to the site on September 22 and the first cross-pollinations were made. Wildlife Officer Roberts undertook all the subsequent work on the project. The following is extracted from his report on the successful production of seed.

"I commenced pollination on September 22 and completed it on September 27. The flowers showed dramatic signs of withering up within two days after pollination had taken place. A total of 17 flowers were pollinated on each of the two plants. Pollen was extracted from anthers by using very fine forceps. Small quantities of pollen were then placed on the female stigma. Numerous new yellow flowers were tagged to determine when petal colour changed from creamy yellow to white. The flowers remained yellow for 2 days, then changed through to white. This colour change process appeared to coincide with the splitting of the bright red anthers.

"New flowers were also tagged with cotton to determine how long unpollinated flowers remained out before they withered up. It was found that each flower remained open for 14 days.

"Again through a tagging system I was able to determine that the flower's anthers (stamens) remained male for up to 5 days. After this period a small protrusion of the stigma could be seen to develop. From this stage it took the stigma 7 days to fully develop.

"On October 14 a plague of caterpillars was found feeding on both plants. All flowers and numerous expanded fruits were eaten by the caterpillars (also at this time one rosette on plant No. 2 had died). On October 15 I erected a small 2" high galvanised fence around both plants. The perimeter was then dusted with common garden dust. This had the desired effect. Numerous dead caterpillars were found on October 16. Also on this date caterpillar eggs and a cocoon were found on plant No. 2. The cocoon, the eggs and caterpillars were sent to Wildlife Research for identification. Other associated plants that the caterpillars were feeding on were *Dampiera eriocephala, Baeckea crispiflora* and *Gastrolobium spinosum*.

"On November 17 the last three flowers on Plant No. 1 had withered up. On November 12 nine fruits from plant No. 1 and three fruits from plant No. 2 were picked.

"Details of seeds per pod (fruit) are as follows:

Plant No. 1-19, 17, 9, 18, 10, 5, 0, 1, 0.

Plant No. 2-5, 9, 2.

"As can be seen by the above figures, fruits of plant No. 2 were not as productive per head as those of plant No. 1. The fruits from plant No. 1 were much larger (2 x) than plant No. 2. More seeds would have been produced from both plants if the fruits weren't eaten by caterpillars. Both plants were watered on numerous occasions.

"Fauna activity was restricted to ants and midgies browsing over both plants. One small unidentified beetle species was seen to activate a trigger of a flower on September 15 on plant No. 1. Unfortunately the specimen couldn't be collected."

The small quantity of seed of *Stylidium coroniforme* obtained from hand pollination provides an opportunity to establish the species in cultivation. Unfortunately, little is known about the horticulture of triggerplants, so the results of attempts to germinate the seeds are unpredictable. Until further plants are found in the wild, cultivation seems to be the only way to prevent the extinction of this attractive plant.