EREMOPHILA STUDY GROUP NEWSLETTER NO. 5 JANUARY 1975

Despite the irregularity of newsletters the group work continues with an increasing membership and a more widely dispersed range of species. In South Australia at least it is obvious that the genus is becoming more readily available and former rare species are now quite common. I think it fair to say that our Study Group can claim some credit for this.

THE BIG WET

Our desert-lovers (eremophilas) were certainly under severe trial over the past winter with the exceptional rainfall over much of southern Australia, and reports of losses have been widespread, especially among the dry area species. Even in well-drained areas this is so, and I know myself the disappointment of seeing valued specimens loaded with buds just collapse and die in a few days. With other species, tips or whole branches died but warmer weather has cured this problem and pruning has tidied up the bushes.

From my experience last year I am wondering about the wisdom of putting out small plants in late autumn. It seems that very tender young plants have no resistance to continual dampness, and I lost quite a number of new species and forms soon after planting in May. Perhaps planting should be either in early autumn or delayed until spring. This brings in the necessity of watering and if a young Eremophila wilts badly from lack of water the recovery rate is low, so constant care is essential.

The answer may be for young plants to be grown in larger containers, but from the plants I have seen kept in pots, they become very spindly. Still that is better than losing them.

My losses have also occurred in older specimens, including E. latrobei, and an unknown W.A. species, each one metre high, which collapsed. I also lost E. goodwinii and E. delisseri, two years old, and both in heavy bud. Note the mention of E. latrobei and E. goodwinii, both of which appeared in Newsletter no. 4; both are beautiful but difficult.

It also appears that the provision of maximum sunlight is important to allow foliage to dry; my E. delisseri and E. goodwinii were shaded. When he visited me some months ago Bert Curtis pointed out how E. longifolia was dying off on the southern (or self-shaded) side for this same reason. Dr. Barlow considers that many of the desert species are adapted to absorption of dew—a great advantage in their natural environment but fatal this last season. Gordon Cousins reports that the plants mentioned in the last Newsletter as surviving the very wet summer eventually died, and I have reports of widespread losses from several other members.

What is the answer? Could it be grafting onto stocks of E. maculata, E. polyclada, or E. bignoniiflora, all of which are thriving? Note that these three all grow in flood-prone country, and are glabrous and semi-succulent in leaf and stem. Are there any volunteers to try grafting? I know for certain that I do not have the time or facilities but perhaps we should be looking at the possibility. The method was described in "Australian Plants", Vol. 2, p. 37.

While on the subject of grafting, it may be opportune to mention that Geoff Needham tried aerial layering of branches of E. punicea, a species proving difficult to propagate. The results were poor, the branches rapidly dying when encased in moist cutting mix, but it may be another way of increasing numbers of those species which are hard or slow to strike by conventional methods. The process was described in "Australian Plants", Vol. 4, p. 246.

RECENT ACTIVITY

Since the last Newsletter there has been considerable activity in the attempt to introduce new species. It is amazing where collections have been made and areas include the Great Victorian Desert, Len Beadell's Gunbarrel Highway, Carnavon--Pt. Hedland, W.A. goldfields, northern edge of Simpson Desert, Ooldea, and areas around Alice Springs and south to Pt. Augusta. Results from all this have been variable despite good quality material with only a few new species surviving and some new forms of those already in cultivation.

From experience I consider late summer the best time when the post-flowering growth hardens off, while results from the flowering season are not good. This is, of course, one reason why we have so many failures from bush trips. We go when flowering is at its peak and the time for taking cuttings is at its worst.

While on the subject of propagation, Geoff Needham says there has not been a very great response to the Seed Bank, either in or out. It is there for your use and experimentation.

ALICE SPRINGS

I was able to meet the Alice Springs members in July when I visited the Centre and areas to the east. It was on this trip that I collected a felty-leaved form of E. macdonnellii, growing in profusion on the northern edge of the Simpson Desert. This form makes a rounded compact shrub averaging 0.6 x 1 m and has huge purple flowers on long peduncles. It is a magnificent shrub and several members have successfully struck cuts. Another addition from this trip was a single specimen of what can only be a form of E. goodwinii, again with rich purple flowers.

One of the sights of the Macdonnell Ranges was E. christophorii in full flower. Shapely upright bushes make this a beauty and as it appears to be adapting quite well to southern conditions it could be a species of true potential. There is a photograph of it in "Australian Plants", Vol. 2, p. 212. A single pure white specimen, which was found 55 km from Alice Springs on the Glen Helen road, has failed to strike.

Other species, either rarely or still not cultivated, included E. elderi, E. willsii (several forms), E. obovata, and a natural hybrid, E. maculata X duttonii. Unfortunately cuts of all these are proving difficult. Seed of several species was collected but so far none has germinated.

John Blakeman was experimenting with seed germination using E. maculata fruit. He gave the fruit a thorough scarification in a rock tumbler (designed for polishing stones), then sowed the fruit in an ice-cream container, replaced the lid and stood the container in the sun. This created almost sauna bath conditions but he had successfully raised some seedlings. Once germination had occurred the container was placed in a cooler position. The experiment was to continue with other species because E. maculata is relatively easy to germinate and results from only one seed collection would be inconclusive.

Before leaving the subject of Central Australia I should report on the fine collecting effort of Lesley and Robin Lamacraft who brought back a lot of good material. One interesting collection was that of a prostrate form of E. willsii, only known to occur in Rainbow Valley, Northern Territory, once again showing how inexhaustible are the forms of this genus.

OOLDEA

The Eastern Eyre Peninsula Group of SGAP S.A. Region made a camping trip to Ooldea in September and sent back large quantities of E. delisseri (3 forms), E. battii, E. hillii, and E. alternifolia in various forms. So far I have no reports of struck cuttings. Joy Noble is our keen member in this Group and although having some chlorosis troubles, she is growing a number of species within a km of the sea at Arno Bay.

NAME CORRECTIONS

The trip to Ooldea reminds me of the fine article by Ron Hill in "Australian Plants", Vol. 1, no. 10, following a visit to this area. However the increasing knowledge now available on the genus reveals that there are some errors in the article which need correction. The drawing and description of a plant given the name E. battii should correctly refer to a form of E. delisseri. This form was collected by Joy Noble as a 2 m shrub and she considered it very different to the typical E. delisseri which is a sprawling shrub of 1 m. (It is interesting to note that in Beard's "Descriptive Catalogue of W.A. Plants", E. delisseri is described as 2–4 m (6–12 feet). Perhaps Ron Hill's E. battii is an eastern extension of the W.A. form of E. delisseri.)

The true E. battii is a low spreading shrub, the foliage is olive green, alternate, and with a serrated tip. Flowers are deep violet and the calyx consists of long ovate sepals whereas E. delisseri has short acute sepals. The two species grow together at Ooldea.

The plant Ron Hill described as E. goodwinii is a stranger to S.A. and probably is an extension of another W.A. species. I have seen the slide Ron took at the time and it is definitely not E. goodwinii. It seems to be a strange mixture between E. granitica and E. willsii, but in the absence of plant material and comparisons with W.A. collections it is not possible to place the plant accurately.

The illustration named E. gilesii also appears incorrectly named and may in fact have affinities with E. gibsonii. His description of size, the location, and the actual slide of the plant all favour E. gibsonii.

I had discussed these three plants with Ron Hill before his death and he agreed that these corrections were in order. It just shows how much work still needs to be carried out on this complex genus.

GERMINATION OF EREMOPHILA MACULATA

Earlier in the Newsletter I mentioned germination of this species. Mrs. Doris Phelps from Loxton has written to tell me of results over a period of 16 months. In April 1973 she gathered up a few handfuls of seed, together with bits of twig, sand, and kangaroo dung, that had been washed into heaps among a large colony of this species. The seeds were pressed into decayed leaves from under a cotoneaster bush, placed in plastic bowls and kept wet. Germination began in 9 days and by August 1974 totalled about 140 plants. Some of the earliest germinations were by then 0.8 x 0.8 m and flowering. (Who said Eremophila were hard to grow from seed? K.W.)

Mrs. Phelps made the observation 'I suspect that a fungus of some kind has a part in the process. Several of the seeds that germinated have had a white mycelium-looking growth on them or on nearby seeds. It also seems that the oldest, shabbiest-looking seeds are the ones that grow.'

Here is food for thought. Dave Gordon considers old seed germinates best and is a great believer in scraping up the trash as well as the seeds, and other members have also reported better results from old seed.

A potted cutting of E. maculata (yellow form) won 1st Prize in a section of the Alice Springs Show in July when entered by Avril Dalby. A further comment about this yellow form is that Margaret Lee has experimented with dyeing wool and has achieved 'good greens' from this form. I presume the leaves only were used.

POLLINATION AND BIRD ATTRACTION

You may recall that in our first Newsletter I asked for any information on bird attraction to eremophilas. Reports have been sketchy but coupled with my own observations, various readings, and deductions, I think the following section should be of interest.

It is considered that birds and insects have a limited colour vision range compared to our own standards of the seven spectrum colours. So we find that birds are attracted to the lower range, i.e. red, orange, yellow, and green, while insects see the upper colours, i.e. blue, indigo, and violet. In order to attract the birds, we must plant the species in their colour vision range.

Following on from this we study the shape of the corolla in relation to pollination and find that invariably those species in the colour range of birds have a long tubular flower with stamens well exserted. The corolla has a four-lobed upper lip, and single usually narrow recurved lower lip, and these species generally are good nectar producers. The colour and nectar attract the honeyeater type of bird and as the bird pokes its beak into the flower to feed, the anthers on the tip of the stamens brush on the bird's forehead depositing pollen. As the bird moves from flower to flower the pollen transfer from stamen to stigma occurs and pollination is completed. This group basically coincides with the subgenus Stenochilus. E. maculata and E. glabra are very typical examples.

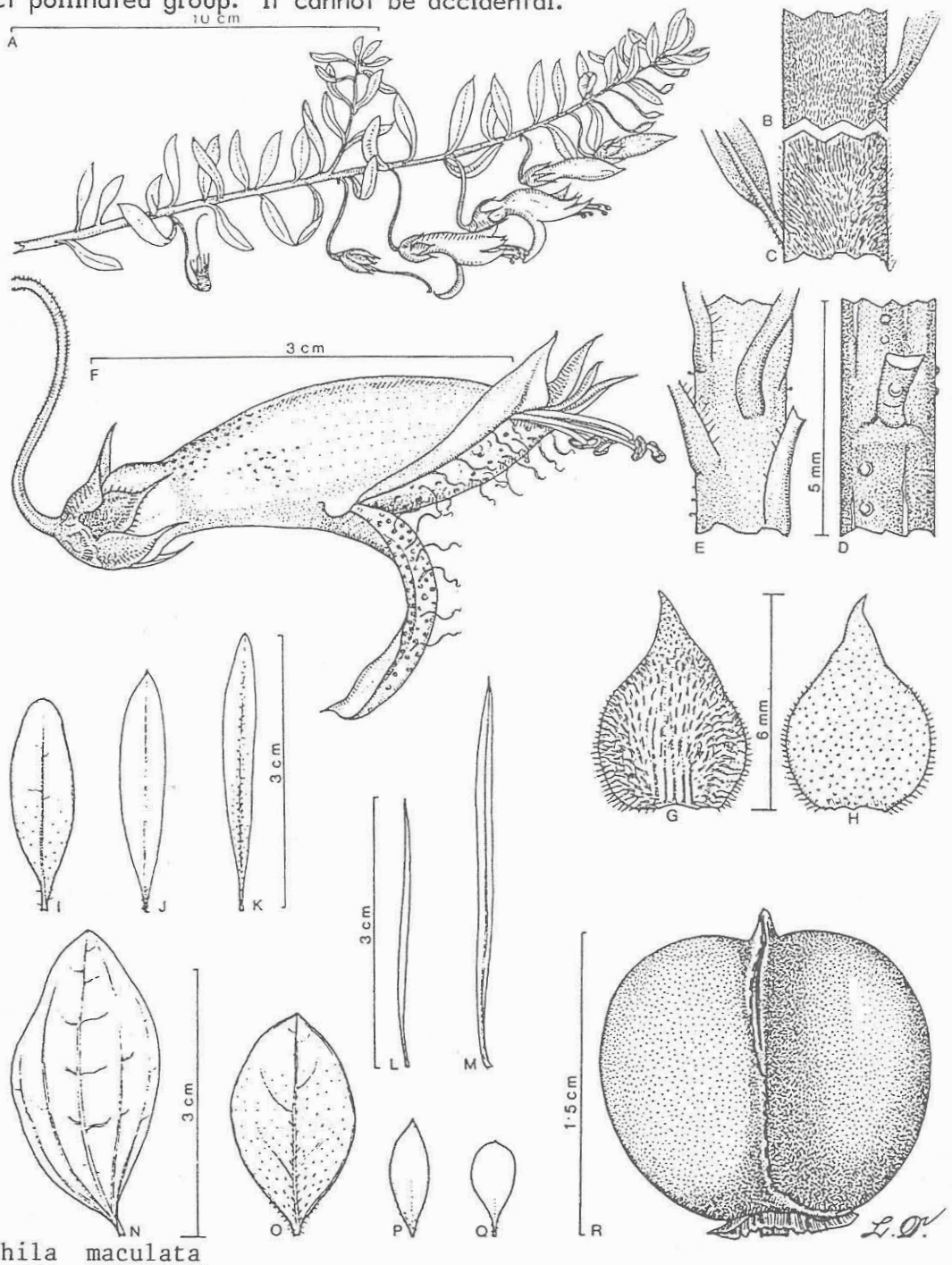
The blue range, which covers those in the insect colour vision range, generally have a broad squashed-shape corolla. The upper lip is bifid and the lower three-lobed, often with the centre lobe wide and flat, making a good landing area for insects. The stamens are hooked across or inside the throat of the corolla so that an insect must brush them on entering the nectary. As the insect moves from flower to flower pollination is completed.

A further refinement in this group, which coincides with the subgenus Pholidia, is the patterning or spotting of the throat. While many Eremophila are spotted it is noticeable that in the bird group the spotting is random and irregular. In the insect group the patterning is quite regular, and I suspect that those straight lines of dots or colour blotches are designed to make the insect tread the straight and narrow. Good examples of this type are E. drummondii and E. macdonnellii.

Then we have the nondescripts i.e. those with pale pastel coloured flowers. These are real compromise creations, as the colour does not attract any particular type of pollination and so we find that the stamens are generally about the length of the corolla and bend half across the opening to make use of either type. Probably they rely mainly on birds as the flowers are often long, but it is noticeable in my plantations that very few mature seeds form in the drupes, although many fruit may be set. Examples, which hopefully wait for birds, would include E. oppositifolia and E. laanii, while more insect-tending species include E. bignoniiflora and E. punicea. E. laanii is particularly interesting, for the white form has anthers at the mouth of an almost straight corolla with five almost equal lobes, whereas the deep pink forms tends to the 4:1 lobe ratio (4 up and 1 down), the corolla is curved and stamens slightly exserted. As the colour approaches the bird range, so the corolla has altered.

A further variation is evident in E. eriocalyx where an almost bladder-like corolla contracts to a relatively small opening. The interior of the tube is a tangle of furry hairs except for a narrow ring route down each side and across the base. The anthers are set over this path. Dr. Barlow considers this is probably designed for ant pollination, unless a particular insect inhabits the areas this species naturally frequents. It is noticeable that my specimen, despite thousands of flowers, has never set a fully-formed drupe, so apparently a pollinator is missing, despite the presence of large numbers of ants.

So what began as merely a recording of species attractive to birds has evolved into a full scale biological surmise, but I think if you study a few flower structures, and keep in mind the limited colour vision range of birds and insects, you will have to agree. To me the most intriguing part of the whole picture is the pattern of the dots and lines in the insect pollinated group. It cannot be accidental.



Eremophila maculata

A, habit; B-E, branch variation; F, side view of flower; G-H, inner and outer surface of sepal; I-M, leaf variations; N-Q, leaf variations var. brevifolia; R, front view of fruit.