

ASSOCIATION OF SOCIETIES FOR GROWING
AUSTRALIAN PLANTS
HIBISCUS AND RELATED GENERA STUDY GROUP

OCTOBER, 2004

NEWSLETTER NO 4

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A few problems in getting started with this first newsletter for 2004/2005.

Most of you will have received a letter from me dated September 1st. 2004, reminding members that subs. were due and that a Field Trip was proposed through the Sunshine Coast Area during Sunday 3rd October, 2004. The Field Trip had to be cancelled due to continuation of drought conditions and unavailability of the Hockings Family who had commitments up North Queensland. Our rainfall for the five months from May to Sept. was only 92 mm whereas our average is 576 mm. The drought broke in mid October and good rain has continued with reduced but reasonable blooming of native Hibiscus in their natural habitat. We will try again next year with the Field Trip. My sister who lives in that area of N.S.W. reports an excellent blooming of **Hibiscus splendens** and **Hibiscus heterophyllus** in the Port Macquarie area as of the last week of October. We need more members and participation in order to keep this S.G. viable. I am continuing with the use of colour images and may have to look at a higher sub. rate if members like the idea. Our annual report along with audited financial returns was submitted to the Study Group Coordinator at the beginning of August as required by the S.G. By-Laws.

This Newsletter will concentrate on the genus *Gossypium*, Family : Malvaceae, particularly the Northern Territory floral emblem (***Gossypium sturtianum*** – Sturts Desert Rose) Perhaps the common name is miss-leading as it is a member of the cotton family not the rose family.

The hairs covering the seed of Australian *Gossypiums* are much shorter than the lint of commercial cottons.

The *Gossypium* genus is distributed in tropical and sub-tropical areas of the Americas (18 species); Australia (17 species); Africa and the Middle East (15 species)

The Australian species are:-

- G. sturtianum J.H. Willis
- G. sturtianum J.H. Willis variety sturtianum
- G. sturtianum variety nandewarensis (Derera) Fryx.
- G. robinsonii F. Muell
- G. australe F. Muell.
- G. costulatum Tod.
- G. populifolium (Benth) F. Muell
- G. cunninghamii Tod.
- G. pulchellum (C. A. Gard.) Fryx
- G. bickii Prokh.
- G. enthyle Fryx described 1992
- G. exiguum Fryx. Described 1992
- G. londonderriense Fryx described 1992
- G. marchantii Fryx described 1992
- G. rotundifolium Fryx. Described 1992

G. nobile Fryx described 1992

G. pilosum Fryx described 1974

G. nelsonii Fryx described 1974

Recently named species came mainly from the Kimberley Region of north-western Australia.

Your Study Group Leader has visited much of Queensland and the Northern Territory as well as the Kimberleys in West. Aust. Extensive trips in April/May 1998, April/May 2002 and January 2003 covered a road distance of 24,113 kilometres. Frequent stops were made to record and photograph the Malvaceae Family.

In discussing the *Gossypiums*, mention must be made of the commercial cottons. Cotton is the 4th largest rural export in Australia, the worth being about \$1.7 billion per annum involving about 1,500 growers.

G. hirsutum (Upland Cotton) Comprises 90% of the world plantings. The other cotton species of some importance is **G. barbadense** (Pima or Long-Staple Cotton). Both these species originate from middle America. An additional 2 species – **G. arborium** and **G. herbaceum** are old world cultigens, not cultivated in Australia. Both **G. hirsutum** and **G. barbadense** grow wild as naturalised or feral populations in northern tropical Australia, particularly along coastal rivers and beaches. Botanist P. Fryxell speculates that these 'primitive' cottons lacking the modern 'breeding' of commercial cottons, may have been introduced by ocean currents from the Americas. Study Group Member, David Hockings recently photographed **G. hirsutum** at the back of a beach in Temple Bay north-east of Weipa on Cape York Peninsular – (identification was confirmed by Paul Fryxell, Research Geneticist from Texas U.S.A.)

During my travels **G. hirsutum** specimens were seen along roadsides West of Roma in Qld., near Kimberley Gorge in West. Aust., Kununurra in West. Aust, Victoria River Downs in the Northern Terr. and 10 kilometres from Winton in Queensland. (The edges of cultivated as well as fallow areas in the Ord. River area contained plenty of cotton) These plants most likely originated as roadside spillage of the cultivated cottons. All those observed (April/May) had reached maturity and produced open bolls.

It is noted that cotton was introduced to Australia on the 'First Fleet' in 1788 and was cultivated in Queensland as early as the 1860's and the Northern Territory by 1882.

The petals of **G. hirsutum** are creamy white at anthesis whilst those of **G. barbadense** are yellow. The heavy cotton pollen remains viable for about 12 hours and is not easily dispersed by wind. It is noted that native bees are very much attracted to the *Hibiscus Furcaria* Section at this time of year (Oct.) and can remove all the visible pollen from a staminal column.

Dispersal of wild cotton seed during the Nthn. Aust. wet monsoon period could be effective along water-ways and coastal environments.

Crosses between the Aust. **G. sturtianum** and **G. barbadense** (yellow flowers) produce red flowers on a sterile triploid plant. The natural occurrence of Australian *Gossypiums* and their possible horticultural use is not considered to be a threat to cultivated cotton, as the industry is located far away from populated areas.

Hybrids between **G. sturtianum** and commercial cottons are sterile mainly because the two species have different numbers of chromosomes. In a sophisticated breeding programme C.S.I.R.O. Scientists Curt Brubaker and his associates, have overcome this problem by using a chemical called colchicine to alter chromosome numbers in the native plant.

3.

The Australian Native Species.

To date 17 species have been recorded (see list) and they are distant relatives of the cultivated cottons. Typically they are found only in native vegetation and are not considered to be a weed threat to the environment or agriculture.

Gossypium sturtianum.

Study Group members, Colleen and Geoff Keena have provided some interesting notes for Inclusion in this newsletter.

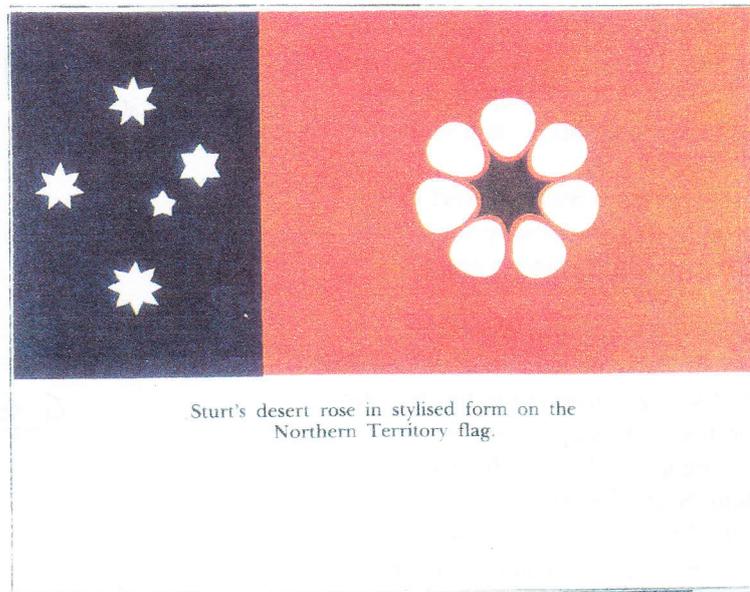
This species is widely distributed from coastal Exmouth Gulf and Port Headland in Western Aust. to Central Australia, eastwards into Queensland. Reaching the commercial cotton fields, Canarvon Gorge and southwards to the southern parts of South Australia. It's indigenous range is southwards of **Gossypium australe** with an overlap north-west of Alice Springs to at least 300 kilometres along the Tanami Road. No natural hybrids were recognised between **G. sturtianum** and **G. australe** or **G. bickii** where their occurrence overlaps.

G.sturtianum is commonly grown in gardens at Alice Springs and at the Yulara Resort near Uluru (Ayres Rock). Many handsome plants with flowers were evident when I was there in January 2003 and I was told by garden staff that they die back to ground level in winter. The Resort is 450 kilometres south-west of Alice Springs and as with most arid regions, the night-time temperature can be extremely cold, probably lower than -6.000 celsius. Soil temperature under those conditions may remain quite warm due to long sunlight hours.

Gossypium sturtianum is undoubtedly the most important species of the Family Malvaceae native to Australia. It is being used extensively in Australia and overseas in attempts to produce transgenic cotton for resistance to Fusarian wilt, gossypol-free seed as a significant food source, compact plant form, higher yields, resistance to insect damage and other desirable characteristics. Of more relevance to our 'native plant growers' is the gardening potential of our Gossypiums, including the selection of superior strains and manipulated hybrids.

Colleen and Geoff Keena grow **Gossypium sturtianum** very well at Glamorgan Vale not far from Ipswich in southern Qld. and I have also grown **G.sturtianum** quite well in containers on the Sunshine Coast. Also **G. australe**, **G robinsonii** and **G. bickii** have flowered for me in containers, but struggle to survive winter conditions.

G. sturtianum is known as 'Sturts Desert Rose' and is the floral emblem of the Northern Territory.



4.

Unfortunately many people confuse the true 'Sturts Desert Rose' with **G australe**, which is so conspicuous when driving to Darwin via the Barkly Tablelands.

The name sturtianum is in honour of Captain Charles Sturt (1795-1869), who first collected the species in dry stream beds on the Barrier Range in 1844/45. Sturts Desert Rose is also known as Australian Cotton, Darling River Rose and Cotton Rose Bush.

The completely hairless plant is a perennial that may endure for many years. The flowers of about 40 mm in diameter are pink to lilac in colour, occasionally white as grown in the Olive Pink Botanic Gardens at Alice Springs. Black spotting can be seen on most parts of the plant and these glands contain the substance gossypol, which is toxic to non-ruminant livestock and humans. These toxic compounds deter insect and microbe attack.

In cultivation **G sturtianum** is considered to be a very ornamental, small bushy shrub from 1 to 2 meters high. The grey, blue/green leaves are entire usually with black stipples (see photographic images opposite), round to oval in shape and about 5 cm. long. The plant when young may be susceptible to grasshopper attack and mealy bug damage.

Though **G. sturtianum** is a drought resistant shrub from the arid zone, it can be propagated and grown successfully in areas of moderate rainfall and perhaps even in high rainfall areas such as the Sunshine Coast, where the average rainfall is 1859 mm. per annum (about 74.5 ins.) Plenty of sunshine, air circulation and a loose well-drained gravelly mix should ensure success. The plants will tolerate light frosts and in cultivation respond to supplementary watering, light fertilizer applications and moderate pruning.

Manipulated hybrids between Sturts Desert Rose and other species of Australian Gossypiums, have the potential to produce larger flowers more profusely than either parent.

The Northern Territory Flag was flown for the first time at a ceremony in Darwin on 1st July, 1978 which marked the grant of self government in the N. Terr. The Flag incorporates the three official Territory colours – black, white and ochre and the official N. Terr. floral emblem, Sturts Desert Rose.

The stylised Desert Rose on the ochre panel has seven petals with a seven pointed star in the centre, symbolising the six Australian States and the Northern Territory This stylised emblem is widely



used on official government stationery, publications and advertising. Of course the flower has 5 petals, not to be confused with the stylised form. Sturts Desert Rose has been depicted 5 times on Australian Postage Stamps – (see image of 18 cent stamp.)

Gossypium sturtianum ssp. Nandewareense is found in the Dehriah State Forest and is considered to be a regionally rare species. This area is expected to be added to the Mount Kaputor National Park. It is reported that the hybrids between **G. sturtianum var. sturtianum** J.H. willis and **G. sturtianum var nandewareense** (Der.) Fryx. are freer flowering and more compact and that the hybrids produce fertile seed. It is possible that excellent horticultural types could be produced from a breeding programme.

The plant derives its name from the Nandewar Range near Narrabri in North-eastern N.S.W., where it was discovered by Dr. N. F. Derera. Strangely enough, it is also known from another limited area in the vicinity of the Expedition Range, which is east of Carnavon National Park in Qld.

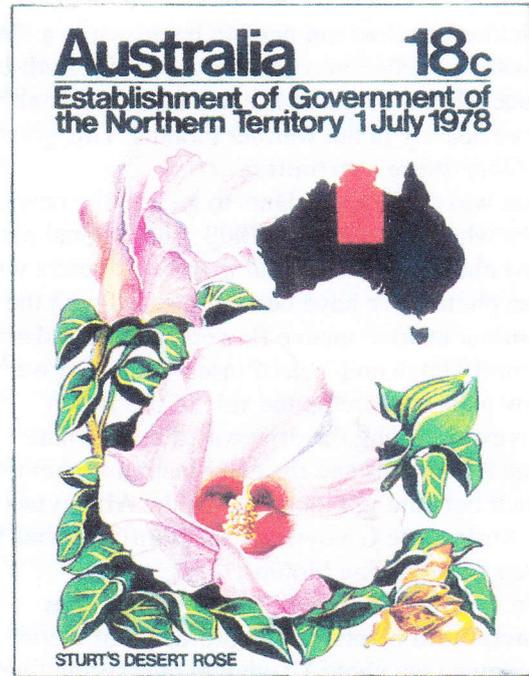
As space prevents coverage here **Gossypium australe** and **bickii** will be carried over for the next Newsletter.

It was intended to mention earlier that more than 90% of Australia's cotton is grown from seed developed by the C.S.I.R.O. Ingard, a genetically modified strain of cotton, has been grown in Australia since 1996 and other strains under trial have been or will be released.

Notes from Colleen Keena , images from Geoff Keena.

For almost 30 years, since returning to Australia from Papua New Guinea, I have been growing as many kinds of Australian Malvaceae as I have been able to find.

I particularly love Hibiscus Section Fucaria, especially **Hibiscus heterophyllus**, **H. divaricatus**, **H splendens** and **H. meraukensis**. However these plants do not cope well with the level of frost we have experienced over the last three winters. We have found that these species are burnt to the ground by -6.00 degrees c. and while they recover, there are few if any blooms in spring but worst of all is pruning the prickly, dead branches. We are gradually transferring the best of these species and crosses between them to the most sheltered parts of our garden where we hope they will be less affected.



However there is one species that so far has not been affected by our frosts and so does not need any pruning of dead branches. It does not even have prickles and does not need to be grown in a sheltered position. Furthermore, in our garden in south-east Queensland, this plant flowers all the year, although more heavily in the warmer months. This great plant is **Gossypium sturtianum**.

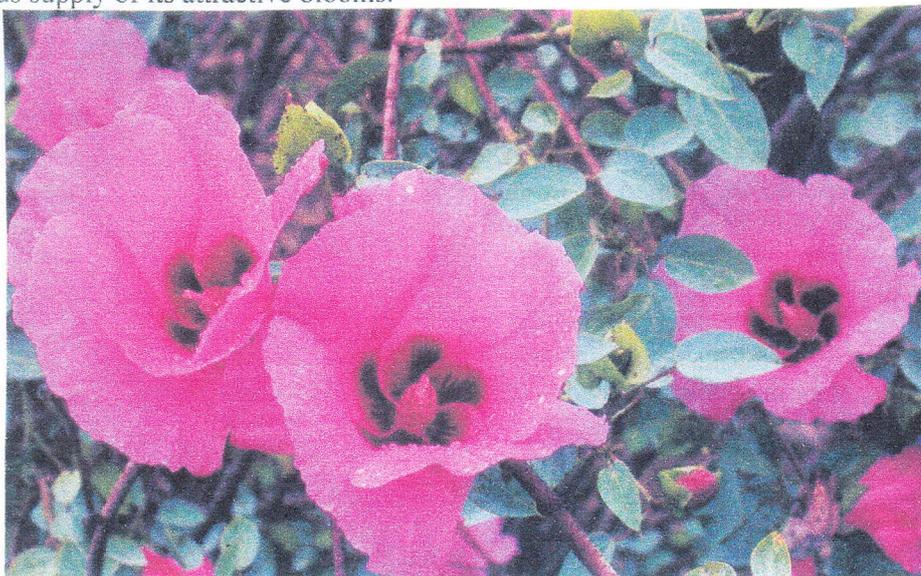
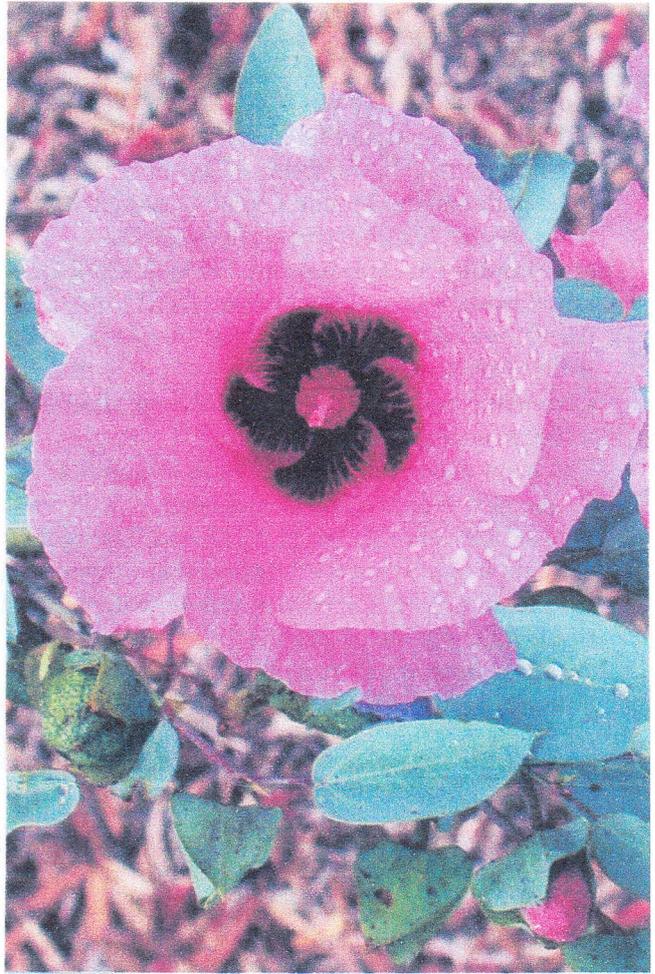
This was of the first plants to go into the new garden here when we moved in 2000. The original plant is now about 1.8 m high and is about 2 meters wide (see photo.) We have been so pleased with the continuous lilac-mauve flowers with their dark red central blotch and lack of insect pests that we have now planted more up the side of the 100 m driveway. Along the driveway they alternate with lilac **Alyogyne**s and the combination is stunning when both are in bloom. When the **Alyogyne**s finish flowering, the **Gossypium sturtianum** plants just keep on providing blooms.

We don't water or fertilise our **Gossypium sturtianum** plants yet the profusion of blooms is stunning (see photo.) Today in mid-spring there are well over one hundred blooms on the original plant which is now 4 yrs. old.

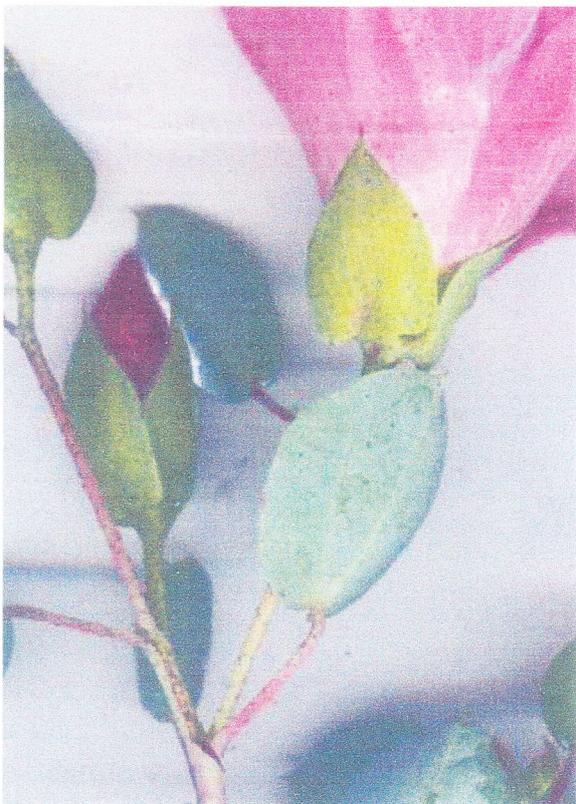
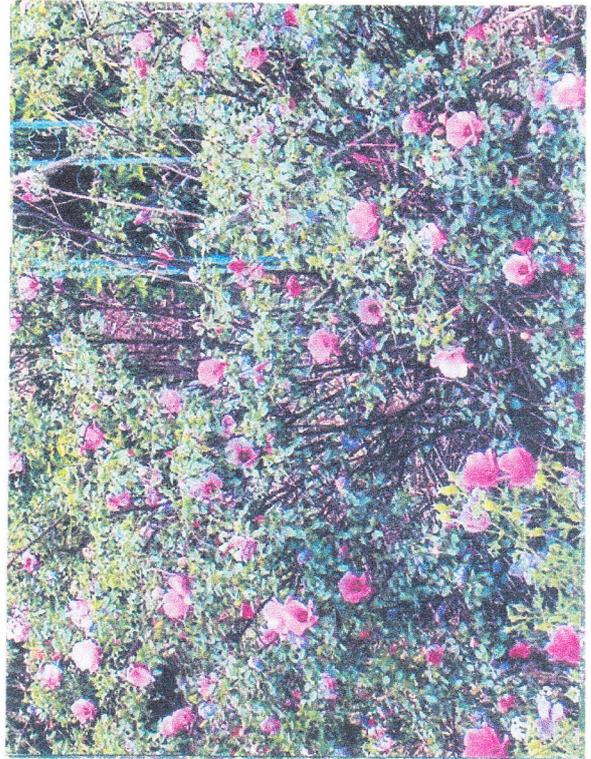
Another advantage of this plant is that it produces huge amounts of seed. It is very easy to grow plants from seed and the plants grow rapidly. I abrade seed before planting for faster germination. I have kept plants in pots successfully although in shade-house conditions they do not flower nearly as well as they do when planted out in full sun conditions. We plant all our plants in raised beds or in areas where there is good drainage.

I have been surprised by the creatures attracted to **Gossypium sturtianum**. See images of a tiny moth, a bee and a tiny green frog.

Gossypium sturtianum is found in the interior of Australia, however it is flourishing in a sunny, well-drained position in south-east Qld. and providing a continuous supply of its attractive blooms.



7.



Images - Geoff Keena - see text