

AUSTRALIAN NATIVE PLANT SOCIETY (AUSTRALIA)

HIBISCUS AND RELATED GENERA STUDY GROUP

MAY/JUNE 2012 NEWSLETTER NO. 25 : ISSN 1488-1488



The above image represents the **Australian Hollyhock, *Malva australiana*** former name ***Lavatera pleibea* var. *pleibea***. Study Group member, Glenys Johnston of Ravenshoe, Nth. Qld. took the photograph on the banks of the Diamantina River at Birdsville on the 22nd of July, 2010. See Newsletter No. 13 for a coverage of this species.



Many of us have a Butcher Bird Family in our locality. The above is a juvenile Pied Butcherbird, *Cracticus nigrogularis* perched on our veranda railing at Buderim on the Sunshine Coast. It is the favourite spot for this family of six individuals during rainy

weather, to keep dry and beg for food. During March 2012 it rained on 21 days yielding 754 ml. We also had some exceptionally wet months during 2010 and 2011, as did much of Australia.

You may well ask 'why deal with Butcher Birds' when the Study Group is for Hibiscus? Well! I think that all the fauna and flora interacts according to the weather conditions, the migration of water birds to Lake Eyre being a good example. In recent times we have had a huge increase in bird population, especially honey-eaters, many of which have become permanent or semi-permanent residents. The Blue-faced honey-eater *Entomyzon cyanotis* virtually cleaned out our yard of web building spiders. They interact with the Butcher Birds that also eat spiders. The Butcher Birds appear to have eaten our normally big population of skinks, including the large Eastern Water Skink *Eulamprus quoyii* and the Pink Tongued Skink *Cyclodomorphus gerrardii*. They also managed to detach two Paper Wasp nests (somehow avoiding the stings) and feeding on the pupa and larvae. I also observed a small Green Tree Snake being butchered and eaten. Potential pests of Hibiscus such as grasshoppers, caterpillars and grubs were significantly reduced or exterminated.

With the constant rain in March, the Butcher Birds were unable to find and capture their normal prey and perched on our veranda railing constantly begging for food. When ignored they moved to the window sill and began tapping with their beaks. To get away from them, I moved to the other side of the house where they immediately reappeared and began tapping on the window pane. Feeling very sorry for them at this stage, I relented and fed them with minced meat, cheese and banana, which they hungrily devoured. My wife is against feeding them because of the mess they make and their pre-dawn song that wakens her. The juveniles in this group of six consist of two one year olds and two older birds. They all respond to the begging cries with the youngest being fed the most and the adults feeding each other on occasions. They are certainly intriguing birds that seem to consider themselves as part of our family. The juveniles will pick up sticks, leaves, clods of dirt etc.. and arrange them in a pile. Is this instinctive behaviour leading to future nest building or just a game? One of the juveniles managed to capture a large grasshopper and during the butchering process was approached by another juvenile intent upon sharing the catch. It picked up a twig and dropped it from the edge of the roof and as soon as the second bird flew down to investigate, it quickly flew into a neighbouring heavy foliated tree obviously to enjoy its food in peace and privacy. Occasionally they will chase each other at great speed dodging through gaps in the tree foliage and around other obstacles. It seems to me that they are playing games and exhibiting a certain amount of intelligence. The Butcher Birds magnificent song has received some scientific study with one observer commenting that the extent and content of their song far exceeded biological necessity. Perhaps their behaviour in the urban environment would make a revealing study.

It remains to be seen if the depleted food source such as spiders, reptiles, etc.. will return

to normal levels when seasons become drier. Any comments from readers would be welcome

In this issue we are remembering Dr. Paul Fryxell who passed away on the 11th July 2011. He authored or co-authored more than 300 Malvaceae taxa names, many of them being Australian Hibiscus, Gossypiums etc.. He was very approachable and corresponded readily with people interested in Malvaceae plants. In Newsletter No. 22/23(b) the article 'A Hypothetical Species' by Alex Nelson makes an interesting read.

Thanks to members who conveyed their appreciation of Newsletter No 24 with Fred Westerman's image of the spider covered in pollen.

In this issue David Hocking's article on Pests and Diseases of Hibiscus and Related Plants, illustrates those that we may encounter in our garden.

Colleen Keena has written about *Hibiscus fryxellii* as a way of remembering the late Paul Fryxell. The images were taken by myself in the King Leopold Ranges when travelling through the Kimberly Gibb River Road in 2002. Seedlings grew quite well at Buderim and by late Autumn were full of bud. Unfortunately the plants quickly died back when cold weather arrived. Some poor quality, under-sized blooms were produced. There was no opportunity to try breeding with the local Hibiscus.

E-mail communication some months ago suggested that the Study Group was lax in not recognising the naturalised *Hibiscus sabdariffa* from W.A. and the N.T. as a variety distinct from the cultivated forms developed and selected for commercial purposes. I saw this variety growing profusely along creek banks in the N.T. during 2002, unfortunately with no ripe seed to collect. When approached with this question Lyn Craven had the following to say – "As to *H. sabdariffa*. Well, as I have only limited knowledge of the species my thoughts may not be all that authoritative. Having said that, I suspect it may be similar to mangoes. Growing all over northern and north-eastern Australia there are plants of the old-style, turpentine-tasting varieties of mango. In plantations today one finds the more palatable varieties, and most younger plants in gardens will be of these types. I can readily accept that the commonly naturalised form(s) of *sabdariffa* are different to ones that one finds being grown in many contemporary gardens. Frankly, unless one is running a breeding program I am not sure what recognition should be given to naturalised populations. There is always the possibility that the NT-Kimberley naturalised populations came to Australia from Indonesia to where it had been introduced by the Dutch (or British, as they had occupied Western Java at one stage), and that the early SE Queensland variety/varieties came from other sources. It is an African plant and it was probably taken to the Caribbean Region fairly early on, and then the British may have taken it from Africa to Singapore and/or India etc. The chances are high that there are several varieties floating around".

Best wishes to all members – Geoff Harvey Study Group Leader, P.O. Box 46 Buderim 4556.

Phone – 07 54451828. E-mail bannh@bigpond.net.au

Cleistogamy - Geoff Harvey

This is a breeding system in which permanently closed, self-pollinated flowers produce fertile seed.

Cleistogamous species that I have encountered include *Gossypium australe*, *Gossypium nelsonii* and *Hibiscus meraukensis*. With these Australian Malvaceae from the dry monsoonal climate and/or the arid centre of the continent, cleistogamy may be experienced early in the flowering season ie. before summer temperatures increase after which normal open flowers will appear. On the Sunshine Coast where I grow then this delay could be as late as the new year. These fully open insect pollinated flowers are known as chasmogamous flowers.

A large number of angiosperm species are known to produce cleistogamous flowers. It is no doubt a genetic trait being a strategy to ensure survival of the species during periods less favourable for normal fully opening flowers to be pollinated.

Some references suggest that the mechanism to permit self pollination has been adopted successfully by some plant species whose natural pollinators have died out.

With *Hibiscus* and *Gossypiums*, I feel that early season low temperatures, inadequate sunlight and slow development of the plants may trigger self pollination through the appearance of cleistogamous flowers.



Gossypium australe – one of the species that produces cleistogamous blooms

PESTS AND DISEASES OF HIBISCUS AND RELATED PLANTS

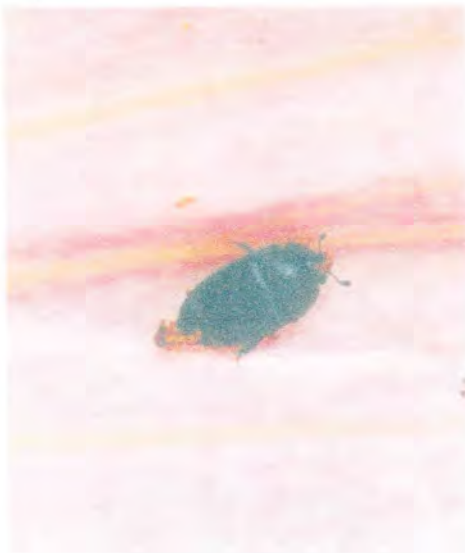
By David Hockings

Australian native hibiscus and related plants are widely distributed in both the better watered coastal regions and also in the dry inland regions. They mostly occur on well drained sites such as stony and gravelly hillsides and ridges but exceptions are *Hibiscus panduriformis*, *fluvialis* and *trionun* var *vesiscarius*, which are usually to be found in areas subject to seasonal flooding, once the water recedes.

All these plants are palatable to livestock and browsing reduces or eliminates plants in areas accessed by stock.

PESTS

Pests attacking flowers.



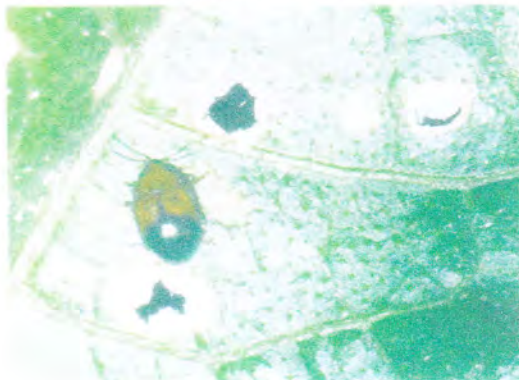
Flower Beetle



Flower Flies

These insects are attracted to pollen, nectar and fleshy petals. They damage the petals. Removal of the spent fallen flowers helps break the breeding cycle. Otherwise, a once up puff of a household knockdown insect spray into the closing flowers – midday to 2 pm – will reduce the population of these insects for several days. Confidor is also effective.

Pests attacking leaves – Chewers.



Flea Beetle

There are several species of beetle called Flea Beetle because they jump like a flea if disturbed. They are serious pests riddling the leaves with chewed holes. When beetles are a problem, plants can be sprayed with Mavrik or Confidor.



These are two of the several colourful **caterpillars** (larvae of moths) that browse on hibiscus leaves.

They can be removed by hand or sprayed with Mavrik.



A **leaf – rolling caterpillar** (moth larva) that cuts leaves into strips , then rolls the strips to construct a shelter. Mavrik spray is effective.

Grasshoppers are very destructive pests, severely chewing both leaves and flowers. The two main species in gardens are the large brown garden grasshopper and the (usually) green long-horn grasshopper or katydid. The former species lays its eggs in the soil and the young hoppers go through several sizes and colours before becoming winged adults. The katydid lays eggs in a cluster on the branches or leaves and progresses through several nymph stages before becoming winged adults. Grasshoppers can be sprayed with Mavrik



Large Brown Garden Grasshopper adult (wings) There are four nymph stages that vary in colour from speckled green to brown.



Common long-horn grasshopper or katydid nymph (not yet winged)

Sucking Pests.



Brevipalpid mite damage.

These very tiny red mites are cyclic, in that they damage the surface of young stems causing silvery or discoloration of the surface and stunted growth, but then revert to an egg stage by the time the damage becomes obvious. Spray with Natrasoap, Mavrik or wettable Sulphur.



Woolly Psyllid. Often mistaken as mealy bug. Spray with Folimat or Confidor.



Mealy Bug can be sprayed with Folimat or Confidor.

Mealy Bug causes a distorted knobby growth tip, sometimes also showing a right angle bend. If you open up this growth the pink mealybugs with white mealy covering can be seen.

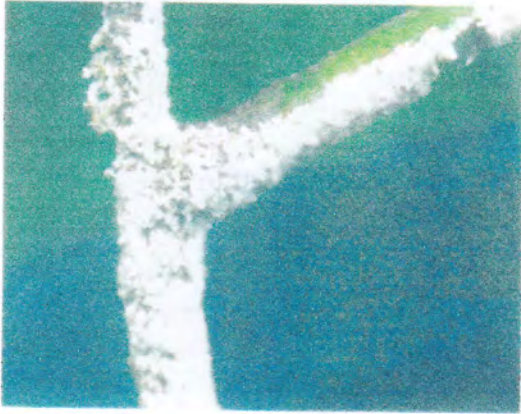


Cryptolaemus can be distinguished from Mealy Bug because the larva move about looking for food, whereas mealy bug is sedentary.

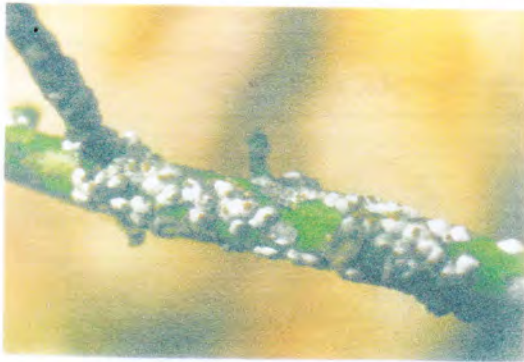
This white insect is the larva of *Cryptolaemus montrouzieri*, the mealy Bug Ladybird, a very important predator that feeds on mealybug and scale insects. Unfortunately it is often mistaken for mealybug and sprayed with insecticide.



Several different scale insects feed and breed on hibiscus. They are often ant tended for the honey dew or sweet substance they give off. This honey dew also may cause the growth of sooty mould – which is black coloured fungus that grows on a sugary solution. Scale pests can be sprayed with Natrasoap, Confidor or White Oil.



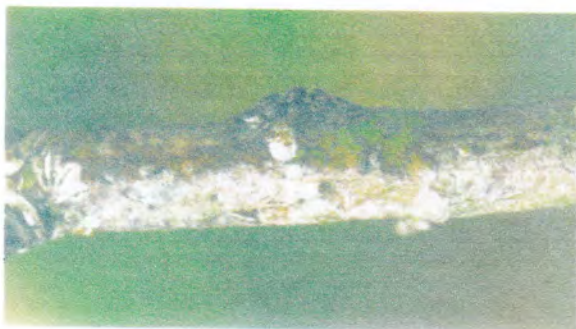
A White Louse Scale



Pink Spot White Scale



**Soft
Brown
Scale**



Latania Scale

This scale is hard to detect on the branches and can be hard to distinguish from the lenticils, but it causes dieback of infested branches.



Spittle Bug These are relatively harmless even though they suck sap. They don't occur in large numbers so they can be rubbed off by hand or hosed off

Harlequin Bug – eggs, nymphs, adult



The spotted orange female guards the ring of eggs until after hatching. The male retains the brilliant colours of the nymphs. If required spray with Confidor.

DISEASES

Root rot diseases affecting hibiscus are usually associated with poorly drained soils, or sites that are subject to seasonal ponding or water-logging or over-watering.

Tubers of deciduous species such as *Abelmoschus moschatus* ssp *tuberosus* are, in a cold climate, easily rotted while dormant. It is best to grow them in pots so they can be placed in a shed to keep the tubers completely dry while they are dormant during winter. The pots are not brought out until the weather has warmed up in mid to late September. Herbaceous species such as *Hibiscus panduriformis*, *fluvialis* and *meraukensis*, die back at the end of summer to within a few centimetres of the soil but if not over watered or dried too severely, may grow again from the base in late spring or early summer.

Nematodes are microscopic worms and include species that feed on plants or animals including insects and even other nematodes. The most obvious group of plant feeding nemas are those known as root knot nematodes because they cause obvious galls or swellings on the roots and in which the nemas develop and feed. There are other groups of nematodes such as those that feed externally causing dead sections of root or dead root tips.

Nematodes are usually more prevalent in sandy and light textured soils but can spread into heavier soils from contaminated hands, tools, infected plants or by water flowing over from contaminated soil. The available chemicals for control are highly toxic to all the organisms living in the soil including those that are beneficial. They need to be reapplied regularly as nemas migrate from outside the treated area and are carried back in on hands, tools, flowing water etc.

The best long-term solution is regular addition of organic matter and use of mulch. Organic matter promotes a large array of organisms that assist in decomposition and recycling and also assist in plant growth. Some of the fungi and bacteria feed specifically on plant-infesting nematodes.

In a DOOR trial carried out with hardwood sawdust, laid as a 10 cm layer of mulch, it took about 10 months for the highly nematode susceptible plants to grow a new nema free root system in the mulch. Apparently it took that time for the beneficial organisms to find and develop in the mulch. The sawdust was pre-treated to prevent nitrogen drawdown by mixing in urea and moistening, then composting for 6 weeks. The mulch layer had to be added to every 6 months to maintain the layer.

Nematode infested plants are very unthrifty, ceasing growth, just stagnating and slowly fading away. A granulated product, NemaCur, is available in a shaker pack.



Root Knot Nematode Galls

HIBISCUS FRYXELLII

Text: Colleen Keena Images: Geoff Harvey*

*H. fryxellii* var.
fryxellii

For those of us living in the eastern states of Australia, it is becoming increasingly easy to obtain plants of native hibiscus which have large, colourful and attractive blooms. The last Newsletter had information on *Hibiscus heterophyllus*, which occurs from Kiama in New South Wales to Cape York Peninsula in Queensland. In the southern part of its range, blooms are white but in the northern part of its range they are yellow. Some plants have pink blooms. Other large-flowered species such as *Hibiscus splendens* occur in the eastern states.

One species extends beyond Queensland to the Northern Territory and to Western Australia. This is *Hibiscus meraukensis* with pastel-coloured blooms that can be large. It mostly grows as an annual. Those in the Northern Territory or Western Australia wishing to grow native hibiscus could consider this attractive species. However, there is a striking native hibiscus species, *Hibiscus fryxellii*, which occurs only in Northern Territory (N.T.) and Western Australia (W.A.). Those of us who have tried growing it in sub-tropical conditions on the eastern coast have so far had limited success and wish we had conditions suitable for such an attractive plant in our gardens. The beauty of this plant can be seen in the photos taken by the Study Group Leader Geoff Harvey when he observed this plant in the north of Western Australia.

This hibiscus was named after Paul Fryxell. *Hibiscus fryxellii* is not considered rare or threatened according to the West Australian Herbarium website, Florabase. Florabase provides profiles of *Hibiscus fryxellii*, *Hibiscus fryxellii* var. *fryxellii* and *Hibiscus fryxellii* var. *mollis*.

Hibiscus fryxellii is described as an erect, prickly shrub, to 3 m high, with pink-violet flowers from April to August.

Hibiscus fryxellii var. *fryxellii* is described as a shrub, to 2 m high, with pink-violet flowers from April to May or July.

Hibiscus fryxellii var. *mollis* is described as a shrub to 3 m high, with pink flowers from April to June or August.

All are found in areas with creeks and gullies and sandstone. Further information on each of these can be found in Florabase. Links to Florabase are included in the references.

In 2003, 'A taxonomic review of *Hibiscus* sect. *Furcaria* (Malvaceae) in Western Australia and the Northern Territory', by L.A. Craven, F. D. Wilson and P. A. Fryxell was published in *Australian Systematic Botany*, 16, 185-218. This paper covers 23 species, including *Hibiscus fryxellii*. *Hibiscus fryxellii* var. *mollis* is one of the new taxa described and it is included in the identification key, with a synopsis and a distribution map, as well as a full page illustration.

The authors note on page 194 that it appears that two distinct morphs are present within *H. fryxellii* and that these are recognised at varietal rank. *Hibiscus fryxellii* var. *fryxellii* is described as strongly aculeate (bearing short sharp prickles) with relatively few stellate (star-shaped) hairs. *Hibiscus fryxellii* var. *mollis* is less aculeate and has a dense layer of soft stellate hairs. It is noted that the typical variety occurs mainly in the southern Kimberley region of Western Australia, especially around the King Leopold Range area. A map shows the distribution of both *Hibiscus fryxellii* var. *fryxellii* and *Hibiscus fryxellii* var. *mollis*.

There is detailed information on *Hibiscus fryxellii* var. *mollis*. A full page line drawing shows a reproductive branchlet, foliar nectary and dehiscent fruit. On page 197 it is noted that it is the most widespread of the sandstone representatives of the section and that it also occurs in the far west of the Northern Territory. The name refers to the soft indumentum (hairy covering) that is a characteristic feature.

The key to the species of *Hibiscus* sect. *Furcaria* in W.A. and the N.T. gives information on both *H. fryxellii* var. *fryxellii* and *H. fryxellii* var. *mollis*:

H. fryxellii* var. *fryxellii

The flowers are not pedunculate (growing on a peduncle or stalk);
Epicalyx is 9-11 mm long, with epicalyx and calyx aculeate; branchlets with stellate hairs sparse to scattered.

H. fryxellii* var. *mollis

Epicalyx is 9-11 mm long, with epicalyx and calyx usually with aculei (prickles); branchlets with stellate hairs moderate to dense.

This brief description shows that *Hibiscus fryxellii* from W.A. and N.T. is not just worth a place in any garden with suitable conditions but is a great way of remembering the late Paul Fryxell.

H. fryxellii var.
fryxellii



REFERENCES:

WEB

Florabase

Hibiscus fryxellii Mabb. <http://florabase.dec.wa.gov.au/browse/profile/4928>

Hibiscus fryxellii Mabb. var. *fryxellii* <http://florabase.dec.wa.gov.au/browse/profile/20470>

Hibiscus fryxellii var. *mollis* Craven, F.D.Wilson & Fryxell <http://florabase.dec.wa.gov.au/browse/profile/20467>

Herbarium sheets

<http://intermountainbiota.org/portal/taxa/index.php?taxon=47547&cl=ASU%20Types>

<http://swbiodiversity.org/seinet/imagelib/imgdetails.php?imgid=256580>

PRINT:

A taxonomic review of *Hibiscus* sect. *Furcaria* (Malvaceae) in Western Australia and the Northern Territory.
L. A. Craven, F. D. Wilson and P. A. Fryxell, *Australian Systematic Botany* 16(2) 185 – 218, © CSIRO 2003.



Obituary

Paul Arnold Fryxell (1927 – 2011)



On 11 July 2011, the world of mallows lost a world-renowned eminent scholar. Dr. Paul Arnold Fryxell passed away in Claremont, California, as a result of heart failure.

Paul was born on 2 February 1927 in Moline, Illinois, USA, the son of Hjalmar Edward Fryxell and Hulda Eunice (Peterson) Fryxell.

Paul received his high school diploma in 1944 from Moline High School, Moline, Illinois and his B.A. degree in 1949 from Augustana College, Rock Island, Illinois. [During World War II, his education was interrupted. He served in the Air Force (1945 – 1946). After an honourable discharge, he returned to his college education.] Paul received his M.S. degree in 1951 and Ph.D. degree in 1955, both degrees from Iowa State University, USA. His Ph.D. thesis title was "A genetic analysis of yield in upland cotton (*Gossypium hirsutum* L.)".

In 1952, Paul began his professional career at the New Mexico Agricultural Experiment Station (Las Cruces, New Mexico). Three years later, he taught at the University of Wichita (Kansas) in the Department of Botany and Bacteriology (1955 – 1957). In

1957, Paul joined the U.S. Department of Agriculture and spent most of his professional career as a research scientist (1957 – 1994). Initially, he was stationed at Tempe, Arizona (1957 – 1965) and later at Texas A & M University in College Station, Texas, USA (1965 – 1994). At Texas A & M University, Paul served as a co-advisor or as a committee member to several Ph.D. degree students. In 1993, he was appointed as an honorary curator at The New York Botanical Garden and also as an adjunct professor (in the then Department of Botany) at the University of Texas. Upon his retirement in 1994, Paul moved to Austin, Texas.

Because of his expertise in Malvaceae, Paul's opinion and collaboration were sought after by many national and international botanists. As a collaborator and a botanical explorer, he travelled to many regions of the world including Argentina, Australia, Brazil, Central America, Mexico, and Venezuela. Most of his plant collections are presently housed at The New York Botanical Garden and the University of Texas-Austin herbaria. Paul had high regards for the works of Indian Malvaceae specialists and had corresponded with them. He felt sad on the untimely death of Dr. V.V. Sivarajan (1944 – 1995).

Paul published extensively, including more than 200 papers in scientific journals, several books, and contributions to many floristic works. He authored or coauthored more than 300 Malvaceae taxa names.

Paul was honoured and recognized by the scientific community, e.g., he served as the president of the American Society of Plant Taxonomists (1983 – 1984) and of the Society for Economic Botany (1988 – 1989); a fellow of the American Association for the Advancement of Science and of the Texas Academy of Science; recipient of the Cotton Genetics Research Award in 1967 and the Henry Allen Gleason Award in 1989; a Fulbright Scholar in 1993, studying in Argentina; listed in *American Men and Women of Science*, *Who's Who in the World*, and several similar biographical references. In his honour, one generic name and seven specific names were published: *Fryxellia* D.M. Bates, *Bauhinia fryxellii* Wunderlin, *Hibiscus fryxellii* Mabb., *Malvastrum*

PAUL FRYXELL: OUR PROFESSIONAL COLLABORATION AND PERSONAL FRIENDSHIP

By Lyn Craven, Canberra, May 2012

My contact with Paul Fryxell commenced when he wrote to the Australian National Herbarium, CSIRO, asking if a botanist from the herbarium could accompany a planned collecting mission to northern Australia in 1983. The mission was being mounted by the United States Department of Agriculture's Agricultural Research Service to collect germplasm of Australian species of *Gossypium*, together with herbarium specimens of these plants. Two UDSA-ARS scientists, Drs Mac Stewart (the leader of the mission and a cotton breeder & wild relatives researcher) and Paul Fryxell (a taxonomist) were to comprise the field party from the US. I joined them as an Australian counterpart. We explored in the West Kimberley region of Western Australia, Cobourg Peninsula in the Top End of the Northern Territory, and the coastline in the Daly River area of the Top End. We collected many *Gossypium* species in the Kimberley and as Paul was interested in the Malvaceae generally, we collected everything malvaceous we came across, plus a great many other plants of interest including *Heliotropium* (Boraginaceae), a genus that I was revising. In all, I estimated we collected about 50 undescribed species many of which ours was the first collection made.

In 1985, a more extensive collecting mission was undertaken by Mac, Paul and I. We travelled from Darwin to Alice Springs, and then via The Granites to Halls Creek and onto Derby where we set off to explore for more *Gossypium* sect. *Grandicalyx* populations. We travelled mainly by helicopter and were able to get to places that had not previously been visited by plant collectors. We did very well with the gossypiums, collecting all the previously described species and six new ones that we subsequently published in a paper revising this group of species (5). Our collections of other mallows were very rich also and we subsequently reviewed the taxonomy of *Hibiscus* sect. *Furcaria* in northwestern Australia (8) and published three other papers dealing with Australian mallows (3, 4, 6).

From 1983 until his death, Paul and his wife Greta and my wife Kirsty and I exchanged seasonal greetings at Christmas. And then there were many updates during the year when Paul and I corresponded on botanical matters. Paul was a very gentle and wise person, with a good sense of humour, and I only hope that some of these qualities rubbed off a little onto me. Our professional links resulted in a satisfying number of publications but our friendship went far beyond that.

List of publications co-authored by Paul Fryxell and Lyn Craven, and others

1. Stewart, J. McD., Craven, L.A. and Fryxell, P.A. (1987). *Gossypium* germplasm from Australia. *Plant Gen. Res. Newsl.* 69: 44-47.
2. Stewart, J. McD., Fryxell, P.A. and Craven, L.A. (1987). The recognition and geographic distribution of *Gossypium nelsonii* (Malvaceae). *Brunonia* 10: 215-218.
3. Craven, L.A. and Fryxell, P.A. (1989). Two new species of *Decaschistia* (Malvaceae) from Australia. *Austral. Syst. Bot.* 2: 461-468.
4. Fryxell, P.A. and Craven, L.A. (1989). *Urena* (Malvaceae) in Australia. *Austral. Syst. Bot.* 2: 455-460.
5. Fryxell, P.A., Craven, L.A. and Stewart, J. McD. (1992). A revision of *Gossypium* sect. *Grandicalyx* (Malvaceae), including the description of six new species. *Syst. Bot.* 17: 91-114.
6. Craven, L.A. and Fryxell, P.A. (1993). Additions to Australian *Hibiscus* (Malvaceae): a new species and a new record. *Beagle* 10: 1-6.
7. Craven, L.A., Wilson, F.D. and Fryxell, P.A. (2003). A taxonomic review of *Hibiscus* sect. *Furcaria* (Malvaceae) in Western Australia and the Northern Territory. *Austral. Syst. Bot.* 16: 185-218.
8. Craven, L.A., Lepschi, B.J. and Fryxell, P.A. (2010). A new species of *Cleome* from northwestern Australia (Capparaceae). *Blumea* 55: 100-101.

coromandelianum subsp. *fryxellii* S.R. Hill, *Pavonia fryxellii* Krapov., *P. fryxelliana* Fosberg & Sachét, *Sida fryxellii* Sivar. & A.K. Pradeep and *Waltheria fryxellii* J. Saunders.

The Flora of North America Association has unanimously voted to dedicate the forthcoming volume 6, which includes his treatments of many Malvaceae taxa, to Paul.

After residing in Texas for almost 40 years (1965 – 2005), Paul and his wife of 63 years, Dr. Greta Albrecht Fryxell, moved to be near family in Cl-

aremont, California. In Claremont, he was affiliated with Rancho Santa Ana Botanic Garden.

Paul is survived by his wife Greta, their three children (Karl Joseph Fryxell, Joan Esther Fryxell, and Glen Edward Fryxell), five grandchildren, and five great-grandchildren.

K.N. Gandhi
(Harvard University)



Hibiscus fryxellii var. *fryxellii*

Image shows the type of country where Geoff Harvey found this hibiscus named after Paul Fryxell.