

## The Glorious Colchicaceae

I was as surprised as anyone to find that the *Gloriosa* lilly ( *G. superba*) which we located on our recent excursion to Mt Archer was not recorded for Port Curtis district. I was familiar with extensive patches of this weed from the sand dunes behind the beaches north of Mackay. I was even more surprised to discover it was no longer a member of the Family Liliaceae but had been moved to the Family Colchicaceae. By coincidence, the species *Burchardia umbellate*, also Family Colchicaceae was featured in the latest NPQ Bulletin (MAR 17) but I was not familiar with it or any other Australian members of the family. I did recall from my university days that colchicine was a drug that we used to arrest cell division in order to study whole chromosomes condensed in metaphase. (Normally chromosomes cannot be seen as they are uncoiled in a functional cell). It was time to take refresher course or do some Googling!

The Family Colchicaceae is found mainly in tropical and south Africa and Asia but there are a few species occurring naturally in Europe, Australia and North America (but not South America). *B. umbellata* (the species featured in the Bulletin) occurs in all eastern states of Australia, including Tasmania but is not recorded in the Port Curtis district. However there are five other species of the genus *Burchardia* endemic to Western Australia. The only member of the Family Colchicaceae listed for Post Curtis in the 2015 Census of Queensland Plants is *Iphigia indica*; a species I am not familiar with but am now keen to see. Recent DNA studies suggest the whole taxonomy of the family is in need of revision. All this suggests a rather complex (and to my mind largely unresolved) biogeography. Presumably the invasion was **not** from Gondwanaland but from the north with perhaps with two independent invasions into Australia. The family, together with Family Liliaceae does however fit within the Order Liliales. There are no species of the Liliaceae listed as occurring in the Port Curtis district. One suspects this may be a case of under-collection.

The compound colchicine is found in all members of the family and was originally sourced from *Colchicum autumnale* (the Autumn crocus). Structurally it is a complex molecule with two seven member rings joined to a six member ring (chemists rejoice). Its structure was not worked out until the 1950s, its synthesis was achieved in the 1960s and its mode of action started to be resolved in the 1970s. As early as 1500 BC, an Egyptian papyrus records the use of Autumn crocus in the treatment of rheumatism. From the time of ancient Greece and Rome, extracts of the corms were used to treat gout. Those of you with a classical background may recall from Greek mythology that Jason and his band of Greeks travelled to Colchis in order to return (steal?) the golden fleece. Colchis is located at the far eastern edge of the Black Sea (modern Georgia) and was reputed to be rich in herbs from which drugs could be derived. And of course there was Medea, the Cholchidian maiden who was an expert with drugs.

As might be expected of a compound that stops cell division (I won't bore you with the actual mechanism) colchicine is highly toxic. It has been used for suicide (and probably murder). Curiously Fayaz (2011) records that in the Maldives, the tubers of *G. superba* are treated and 'made into a very sought after sweet wafer'. All this reinforces the observation by Avicenna that the difference between a poison and a medicine is often a matter of dose rate. (Personally I would be very cautious of the colchicids!).

Another side story I turned up in my Googling was the commercial history of colchicine. As essentially a herbal remedy, colchicine was until this century an unregulated substance and sold quite cheaply (approximately 9 cents per tablet). As a result of changes to US regulations in 2006, pharmaceutical companies became involved and the price has risen by several thousand percent. I assume no royalties go to the herbalists of yesteryear!

Contributed by Bob Newby