Sri Lanka: A victim of bio-piracy

Binara: Symbol of beauty and purity pirated, propagated and patented

by Jagath Gunawardana

Five species of plants belonging to the genus Exacum, known in Sinhala as Binara, Ginihiriya and Ginaththa, constitute a group of beautiful and well-known wild flowers of Sri Lanka. Four of them, including two endemics have blue, violet or purple flowers. The sole white-flowered species, Exacum Walkeri, is also an endemic. The Binara flower denotes both beauty and purity, making them a much sought after offering in Buddhist Temples since ancient times, and prompting Sinhala people to name their daughters after this flower. According to the Sinhala nomenclature of months a stamp valued at 75 cents, depicting a flower of the endemic E. trinervum, which has the largest flower, was issued in 1978. Therefore, when news reached the country in early 1990s, that these plants have been surreptitiously taken out of the country, developed as ornamentals and have been the subjects of patents in the United States of America was met with a lot of anger and even with a sense of disbelief by many.

The most important lesson behind this episode is that a country like Sri Lanka can do very little or nothing after the propagative material of a plant is secretely or openly taken out. Such plants could be sold under the correct scientific name or with an attractive trade name. In a case where a plant patent for a cultiver is invalidated by a re-examination, it does not stop the plant being sold, nor does it provide the country of origin with any compensation. It will only end the monopoly, thus providing an opportunity for others to sell the same kind, which most likely would benefit the competitors, rather than the country of origin which which may not be keen to sell the same plant.

Many countries including Sri Lanka do not provide for the patenting of plants and animals. But, several industrialised countries allow patenting of plants. Notable among these is USA, which passed the first such the Plant Patent Act of 1930. In addition, the US Patent and Trademark Office (USPTO) provides utility patents (also known as industrial patents) for plant varieties since 1985, the notorious Basmethi patent being an example. A search of the accessible patent databases of all countries revealed that there are nine patents that are related to plants of genus Exacum.

Of these nine patents, the two obtained in Japan do not cover a plant variety but only ways or methods of producing new plants. These belong to the usual type of utility patents that are given to a new method or process of doing a certain thing and are usually referred to as "Process patents". These two patents do not have any bearing or implication on our plants nor on any others belonging to the Exacum genus. However, it is not possible to obtain even this kind of process patents in Sri Lanka as Section 59 (3) (b) of the Code of Intellectual Property Act, no 52 of 1979, exclude the patenting of any essentially biological process for the production of plants. The other seven patents cover varieties of Exacum plants. The first two, obtained in USA and Australia in 1984 are for the same variety named Blue Rococo. The number of patented cultivars is therefore six. The inventor named in all seven patents is Erik Rosendal of Denmark. Five patents are assigned to Nurserymen's Exchange of San Fransisco, USA, another to J and J Plants Inc., Texas, USA and one to Daehnfeldt A/S, Denmark.

Under the Plant Patent Act (1930) of USA, a variety or cultivar is eligible for patent protection if it is distinct from all others known cultivars by at least one distinguishing characteristic. It could either be an invention or a discovery by the inventor and has to be proved to be stable by asexual reproduction. In addition, it has to be new (novel) and if discovered, should have been in a cultivated area. It is not necessary to be made (invented) by an inventor, who may be the one who first saw it as being different and isolated it from the other cultivars. It can be either a natural (spontaneous) mutation or induced mutation. Similarly, the term asexual reproduction does not mean only those conventional methods of cuttings, laying or budding, but all others such as tissue culture as well. If the person who reproduced it is different from the one who discovered it, then both become co-inventors. Tuber propagated plants such as potatoes, though they meet these criteria cannot be patented under this act.

An analysis of the six US patents with the requirements reveal the following.

1. They are distinctly different at least by one clearly definable characteristic from the parent variety. In one this is in the growth habits and in the rest the characteristics of flowers and colour differences.

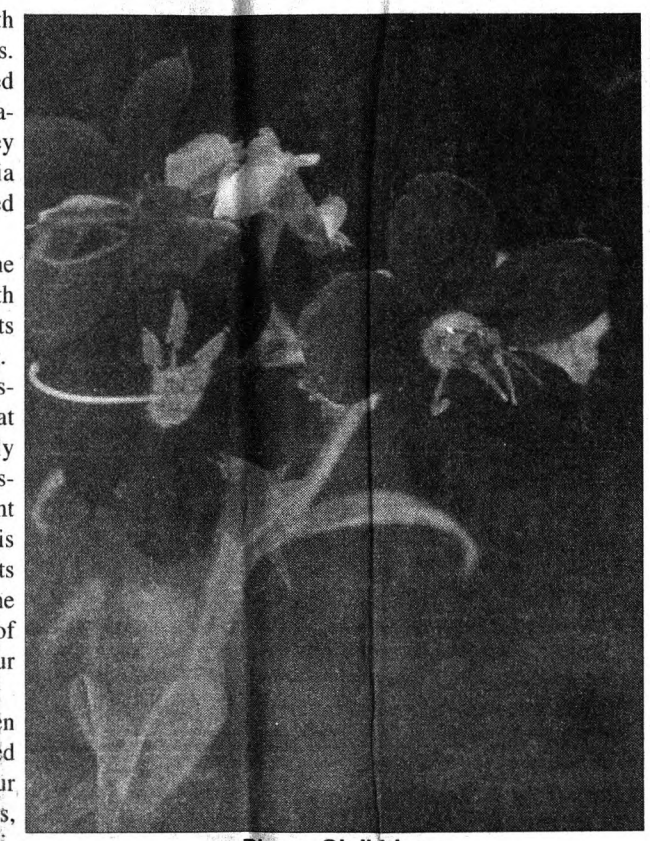
2. All have been asexually reproduced from cuttings. Four have sterile flowers, making it only possible to reproduce them by asexual means only.

3. The parent varieties are named and the differences in the new variety have been described.

4. These have been all taken for mutations, either natural or induced and not for an existing variety.

5. All are claimed to be new and in spontaneous mutants, the period of discovery, and induced mutants, the period when radiation treatment was done are mentioned.

The first two patents in 1984 are for a cultivar named Blue Rococo or Rococo, which, according to the patents, differ from the unpatented parent variety named "Midget", by having sterile anthers (male parts) of the flower which have in addition acquired the shape and colour of petals. It has been discovered as a spontaneous mutation. The patented cultivar Blue Rosette is a provoked mutant made by exposing tissues of Blue Rococo to radiation treatment. It differs from the parent cultivar by having lavender violet-blue flowers and having the sterile petal-like stamens arranged as an incurved rosette. Since both these new cultivars are Sterile, they can only be reproduced by asexual means. These three patents have been assigned to Nurserymen's Exchange.



Binara Ginihiriya

White Binara

Another provoked mutant is the patented cultivar named Best Rose, made by exposing tissues of an unpatented cultivar named Best Blue to radiation treatment. It has five heart shaped petals in a flower like the parent, but are coloured rose-purple instead of being blue-violet as in Best Blue. The cultivar Blue Ropendal, the subject of the last patent in the Exacum series has been a naturally accuring mutation of Best Blue. It has flowers which have five heart-shaped petals coloured blue-violet like the parent and the only difference lies in the growth habit. It has a cascading growth habit or the branches hang around end down, making it an ideal plant for hanging pots and hanging baskets. The Best Rose patent is assigned to Daehnfleklt in Denmark and Blue Ropendal to J and J Plants Inc. of USA.

The other two patents have been obtained for two white-flowered cultivars. One named Double Exacum White is also named White Rococo and is described as a spontaneous mutation of an unpatented cultivar named Pure White. It differs by having sterile anthers shaped like petals. The other cultivar named as White Rosette is described as a spontaneous mutant of the unpatented Best White cultivar. In this, the sterile anthers have been transformed into a rosette of petals. These two white cultivars have been assigned to Nurserymen's Exchange.

The characteristics given in a plant patent about the new variety and how it differs from the parent cultivar helps to make a profile of the parent which in turn can be compared against the characteristics of the native Exacum species to check the ancestry of a cultivator. It was seen that information provided in the Blue Rococo and Blue Rosette were insufficient to build a good profile of the characteristics of the cultivar "Midget". However, the features given in the patents of Best Rose and Blue Ropendal were sufficient to discern the characteristics of Best Blue.

A comparison of these with the native species clearly show that it is identical to the endemic Exacum trinervum macranthum, the large flowered sub-species which has blue-violet heart-shaped petals. This particular plant, is much acclaimed for its beauty and is known as Maha-Binera and some others call this Binara or Nil-Binara and all others as Ginihiriya. The descriptions in the two white flowered cultivars are similarly helpful to discern the features of the parent cultivars. It shows that the only difference of Best White and Pure White is only a slight difference in the colour of petals and that both are identical to our endemic white-flowered E. Walkeri, the Sudu-Binara or Sudu-Ginihiriya.

It is significant that no patents have been obtained since 1990. A plant patent obtained in USA is valid only within the country. The reason for five of these being assigned to US companies may mean that they would have intended to introduce these cultivars to the US market.

Patent no.	year	country	title
AU 24652	1984	Australia	Exacum affine pot plant
PP 5203	1984	USA	Cultiver Blue Rococo
PP 6154	1988	USA	Exacum named Blue Rosette
PP 6927	1989	USA	Exacum plant Best Rose
PP 7224	1990	USA	Exacum plant named Blue Ropendal
PP 5914	1987	USA	Double Exacum White cultivar. White Rococo
PP 6107	1988	USA	Exacum named White Rosette
JP 6098653	1994	Japan	Production of seeds and seedlings of plants of genus Exacum
JP 6105628	1995	Japan	Production of seed stock of plants

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Though Dahnfeldt is based in Denmark, it sells plants in US and could well be the reason for obtaining a plant patent. The introduction of new cultivars have continued and it was a catalogue for two named Royal Blue and Royal White by Dahnfeldt in early 1990's that first drew the attention of Sri Lankans to the biopiracy of Binara. These had been widely advertised and sold in Europe. These are seed-propagated and could not be subjected to Plant Patents, but could be covered by either a utility patent or Plant Variety Protection (PVP) certificate or by both. To obtain a PVP, a cultivar has to be new and have at least one distinct characteristic. It is clear that even PVP cannot be obtained for cultivars such as Best Blue, Best White and Pure White which do not have even one distinct difference. The exact characteristics of Royal Blue and Royal White are not known. The names of these two have been registered as trade names. It is a common practice in the ornamental plant trade to give new cultivars attractive names and even register these if needed.

There are several questions that still remain unanswered. It is not possible to identify those responsible for the bio-piracy of Binara not the period when it happened. It is our experience that those who came in search of biological material are often collector who sell their findings to others. It is quite possible that Erik Rosendal would have bought these material from another source. A new variety has to be asexually propagated for several generations before the application for a plant patent is made. The first application for a patent had been made only in 1982, making it possible that at least some of the material would have been taken in 1980 or before. It is quite possible that material had been taken out in several instances.

The reasons for the lack of new patents could be several, though cultivars have been offered for sale. There could have been no new mutants, or the nurserymen could have concentrated on producing only seed propagated varieties. Since a patent is valid only in a particular country it is not worth to get a patent if these plants have failed to gain a considerable demand. It could be the same reason why there are no Australian patents since 1984. In contrast Exacum plants, especially these with flowers in the blue/pink/violet range are very popular in Europe as winter blooming, blue flowered plants have a high demand.

The most important lesson behind this episode is that a country such as Sri Lanka can do very little or nothing after the propagative material of a plant is secretly or openly taken out. Such plants could be sold under the correct scientific name or with an attractive trade name. In a case where a plant patent for a cultivar is invalidated by a re-examination, it does not stop the plant being sold, nor does it provide the country of origin with any compensation. It will only end the monopoly, thus providing an opportunity for others to sell the same kind, which most likely would benefit the competitors, rather than the country of origin which which may not be keen to sell the same plant. However, such moves would deter those who try to create monopolies out of pirated plants. In the case of Exacum cultivars, Erik Rosendal can justifiably claim that he is the inventor and discoverer of the mutations and the patents are valid unlike in some other instances.

The failure to trace the parent of "Midget" cultivar due to the absence of certain features has an important message. That is, a patent needs to show only those features necessary to prove the novelty and distinctness of a cultivar and one can make use of this to keep out certain features that are not needed to be included for the purpose of the patent, but essential to be known in order to trace the ancestry of the variety to cover up instances of biopiracy. In these instances, it could not have been due to such an ulterior motive as the subsequent patents have provided enough details for such probes.

There are still several species and subspecies of Exacum that are not known to have been taken out. Even in the two that have been taken out, there could still be more variations that are liable to be needed for the development of more cultivars. Therefore, it is urgently needed to stop all exports of any propagative material of Exacum plants, unless a full disclosure is made of the reasons and the party exporting such material agrees to share profits, a principl that should apply to other plants as well.

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