The elusive *Camellia piquetiana*

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Plant hunters have searched the globe travelling to far and distant places for millennia, but only in recent times have plant breeders realised the value of the earth's germplasm. Vietnam, with an area of 330,000km^2, contains at least 12,000 plant species (Chang & Bartholomew 1984) and is one of the centres of distribution for the genus *Camellia*. Together with China and South America it is still a relatively unexplored region (Chapman & Wang 2002).

It was whilst searching through literature that the name *C. piquetiana* (Pierre ex

Laness.) Sealy, emerged. This species of *Camellia* was originally described by J.B.L. Pierre as *Thea piquetiana* in his work of 26 parts, *Flore forèstiere de la Cochinchine* (1880-1907). Here *C. piquetiana* was described as having purple flowers, probably the only known *Camellia* species of this colour.

Jean Baptiste Louis Pierre (1833-1905), a renowned French botanist, was born on the island of Réunion and studied in Paris until the year 1855, when he moved to Strasbourg. From 1861 to 1865 Pierre worked at the Calcutta Botanic Gardens. In 1865 he became the director of the Saigon Botanic Gardens, (now Ho Chi Minh Zoo and Botanical Gardens), a post he retained until 1877 (Stafleau & Cowan 1983).

The construction of Saigon garden started in 1864 and the intention was to grow imported industrial plants, such as cacao, coffee, vanilla and tea. Pierre collected extensively in Cambodia, Cochinchina and South Siam (Thailand) and had the support of the then Ministère de la Marine et des Colonies, M. Jean Marie Antoine de Lanessan (1843-1919) (Stafleau & Cowan 1983).

Lanessan was not only the minister responsible for the administration of French colonies, but was also a botanist and an author of several botanical books. The evidence shows that it was Lanessan who instigated the collection of *Thea piquetiana* and possibly at least two other *Camellia* species (Stafleau & Cowan 1983).

Thea piquetiana was collected by Pierre, but not in 1708. Some publications erroneously cite this number as the date of discovery. 1708 is purely an accession number given to a collected specimen. *Thea piquetiana* was collected before March 1877 (as attested by pressed herbarium specimens in the New York Botanical Gardens obtained from Paris, NY Specimen ID: 148779 and 148780). Sealy (1958) is of the opinion that it was collected in the year 1866.

All initial attempts to find *C. piquetiana* by the authors of this work, in collections, or in a known site in the wild, met with failure. According to Pierre, the species was collected near Chao, in the province of Bien Hoa and in the area of the headwaters of the river Dong Nai (Sealy 1958). A map of this watercourse inspires awe as the area is large and the tributaries are numerous.

The fact that the region of the initial discovery of *C. piquetiana* lies in the subtropics, heightened the interest of the authors even more. Hence two private expeditions were organised to search for this plant.

The first expedition, mounted in 2001, met with disappointment. The authors were aware that *C. piquetiana* was once planted in temple gardens throughout the southern parts of Vietnam. Rumour had it, that it was still cultivated in some of the buddhist temples in the south of Vietnam before the American war. It is almost certain that it was never cultivated outside Asia.

The second expedition to explore the headwaters of the Dong Nai river for sub – tropical and tropical species of *Camellia* was undertaken by the authors in February 2002. Due to the nature of the region, i.e. the extensive geographical area, poor or no roads and a jungle environment, we decided to visit this region in the dry season.

The main species to be investigated was the reputedly extinct *Camellia piquet-*

iana (Pierre) Sealy. This purple species, as indicated by its previous description by Pierre, could provide a key to anthocyanin pigments in breeding for all subtropical Camellias. Publications and herbarium records indicated that this plant has not been found or seen since the collection of the original type specimens. Through the good offices of the Royal Botanic Gardens in Sydney the authors managed to obtain the photostats and drawings of the isotype specimens from the Royal Botanic Gardens, Kew. Many thanks to Dr Neville Marchant for his enthusiastic help. The 2002 expedition succeeded in re-discovering this long lost species and as the cliché says, 'the rest is history'.

Several mature trees, up to 8m in height, were located by the authors after a long trek through the jungle. One plant, perhaps several hundred years old, was discovered in a small ravine. It had at some stage in the distant past been cut off, probably for firewood. Fortunately it has regrown and is now a fine flowering specimen.

The other mature trees and numerous accompanying smaller plants were found in the secondary jungle. This was an evergreen, broadleaved, two storey forest typical of the region, which in the past suffered from the logging of larger trees, thus allowing for the invasion of bamboo, *Rubus spp*. and other weedy plants.

The presence of immature fruit, buds and flowers indicated that *C. piquetiana* produces flowers from November to March. The flowers were pink, suffused with purple and very attractive, with sepals of an orange colour. This species is unusual in that it has perhaps the longest leaves of all *Camellia* species, up to 55cm. Illustrations appear on page 145 of this book.

The extant trees are in a very vulnerable situation, as land in the vicinity is being continuously cleared to grow perennial crops.

The following botanical description varies slightly from that recorded in literature. On first impression the mature plants are taller, the leaves can be marginally larger and the flower styles do not protrude to the extent indicated by the drawings (Sealy 1958, Hoang Van Ho 1960-1993).

Description of *Camellia piquetiana*

Small tree, to 8m with trunk 200mm to 250mm in diameter, tending to be tall and narrow when surrounded by dense vegetation. Branches grey to brown, glabrous. Older branches slightly furrowed. Leaf petiole slightly curved, thick and fleshy, up to 20mm long and 5mm wide, purple coloured on upper side. Leaves up to 550mm long to 150mm wide. Lamina coriaceous, oblong to elliptic, apex broadly cuspidate, base obtuse to rounded. Adaxial leaf surface glabrous, deep green, shiny, lighter green and dull below. Lateral veins up to 22 pairs, sunken above, protruding on the abaxial surface, pinnately arranged, camptodromous, brochidodromous. Margins entire and undulate, perhaps very broadly crenate. (The margins have a distinct ridge-like profile apparent when viewed from the abaxial side). Flowers pedicellate, pedicels 10mm, glabrous, axillary, occasionally terminal, up to 3 flowers in each axil. Bracts subtending the flower only present sometimes. Flowers 30mm to 50mm in diameter with 5 concave petals, 20mm wide and 20mm long, with 5 sepals. Sepals dark green to purple, 10mm to 12mm long, coriaceous, rhomboid. (The 5 bracteoles on the outer side of the sepals are persistent even when the flowers are removed). Bracteoles purple inside, orange outside. Androecium 10mm to 15mm long, partially glabrous. Filaments extremely numerous. Gynoecium glabrous five locular, 20mm to 25mm; styles three to five, separate and entire, protruding only very slightly. Immature fruit, purplish brown, flattened, globose, 25mm high, diameter 40mm. Fruit five

locular, dehiscent and roughly ridged, with 5 indehiscent secondary ridges. Two ovules per locule. Valves attached at the top and bottom even after seed shed. Some dry fruit remains attached to branches after seed fall.

It should be noted that several other *Camellia* species yet to be identified were located in the same region. These were all of the Protocamellia type, with flower colours ranging from white/cream to pink.

As evident, there are some differences between the descriptions of Pierre and later Sealy and the specimens collected by the members of the 2002 expedition. Freshly collected flower specimens of *C. piquetiana* are in fact dark pink with a noticeable purple tinge. The purple pigment becomes more visible when the flowers are looked at in the shadow, away from bright sunlight. From experience, even partially dried herbarium specimens of *C. piquetiana* flowers are decidedly purple.This 'chameleonic' property of the flowers may explain the noted discrepancy. It is expected that the completion of current studies into the flower pigments of selected *Camellia* species will furnish vital data, which may shed some light on this very interesting subject. Pierre and Sealy described *C. piquetiana* flowers as purple. We know that Sealy worked only with dried specimens. The isotype specimen held by the Royal Botanic Gardens, Kew is accompanied by a determinavit slip, which appears to be written by Sealy (Dr Neville Marchant *pers. comm*.)

Was the original description of *C. piquetiana* flowers made while looking at dried flowers? This is quite possible, as fresh flowers do not preserve well in the hot climate of south Vietnam.

The only other difference, which is perhaps more significant, is the length of the female flower parts, ie. the styles. The drawings accompanying Pierre's description feature 5 (or 6) prominent styles, while Sealy describes the 5 styles as only about 24mm long. The styles on several flowers studied in 2002 appear to be shorter, perhaps some 15 to 17 mm long, and thus less prominent. In the future a larger number of flowers will be collected in order to obtain more measurements so that statistically significant comparisons may be made. Otherwise, all other morphological characters contained in our 2002 descriptor agree with those of Pierre and Sealy. No other known *Camellia* species fits the description given above.

The extent of any impact on the development of new *Camellia* cultivars by incorporating species *Camellia* that contains purple pigment can not be overestimated.

Graeme Richards is the plant breeder for fruits and ornamentals for the University of Western Sydney. He is involved with the genus *Prunus*, incorporating low chill, or warm-growing germplasm into high chill or cold loving species. This practice is performed by conventional hybridising techniques and can be applied to most plant genera where warm-loving species can be found that are not too distantly related. Modern DNA techniques can take some of the guesswork out of such undertakings. Fingerprinting of chloroplast and nuclear DNA of newly acquired *Camellia* species (including *C. piquetiana*)

and their taxonomy, is being studied by George Orel with the help of the staff at the Royal Botanic Gardens in Sydney.

Camellia breeders have long been at work developing new cultivars. These are mostly cool-growing with colours restricted to white through pinks to red with bi-colours also being possible. The question is whether we could have yellow, orange and apricot blooms. Numerous yellow species have been discovered in recent years, mainly from southern China and north Vietnam. Could yellow species be crossed with pinks and reds, to get a new range of colours? The authors believe this to be possible,although until now most attempts by others have met with little success. One fact remains: the yellow species are difficult to hybridize.

The yellow species, which are currently being used, have waxy or glaucous flower buds, whereas most other species have pubescent or hairy buds. It was while searching for pink or red species with waxy buds that the authors came across the Protocamellia group. The members of this group were smooth budded, subtropical species, namely the recently discovered *C. vidalii* Rosmann.

The species, however, that may be able to perform the task of hybridisation are *C. amplexicaulis* (Pitard) Cohen (pink, red and white of north Vietnam) and *C. rubriflora* (Ninh & Hakoda) from Mt. Tam Dao.

The locations of all 2002 finds need to remain a secret: it is important that the trees are noted and preserved. The photographs and film footage of *C. piquetiana* taken by the expedition's cameraman Stephen Jones, shows that it is indeed a beautiful flower and worthy of cultivation in its own right.

What contribution these new species of *Camellia* can make to the gardening world, both in their own right and by hybridisation, remains to be seen. It will be the task of master propagators and marketing experts like Clayton Harland to ensure the viability of this new product.

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Clayton Harland is a plant breeding assistant at the University of Western Sydney, and is interested in the breeding and propagation of *Prunus* varieties, alternative crops and 'yellow' Camellias.

Stephen Jones is a graduate of the University of Western Sydney and is a film maker interested in rare plants and plant breeding. He is studying environmental science at the Southern Cross University at Lismore.

George Orel is a PhD student at the University of Western Sydney and Royal Botanic Gardens, Sydney, and is currently writing a thesis on the breeding of *Juglans*. He is interested in Pinaceae, *Salix*, and the species of *Camellia*.

Graeme Richards is a lecturer in Horticulture, with extensive experience in production horticulture, and the head of fruit and ornamental tree breeding at the University of Western Sydney.

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