Table 1 *Antibacterial activity*[+] *of compounds from Pterocarpus marsupium*

Compound	*S. faecalis*-R[a] I_{50}% (μg/ml)	*S. aureus*-R[b] I_{50}% (μg/ml)	*E. coli* MIC (μg/ml)
Penicillin G	0.5	6	64
Propterol	8	16	124
Propterol B	54	68	114
Carpusin	64	72	140
Marsupol	60	68	138
Pterostilbene	24	38	196
Oleanolic acid	92	110	220
Liquiritigenin	18	30	164
Isoliquiritigenin	12	24	150

[+] The values expressed are the mean of three experiments.
[a] designated as *S. lactis* R or Rg1A strain in some early literature
[b] penicillin G-resistant strain.

actually killed by adequate concentrations (50–80 μg/ml) of these compounds. All these compounds are less active towards the gram-negative organism, *E. coli*. All the compounds lost nearly 30% of their antibacterial activity when they were added to the medium prior to sterilization, indicating partial destruction of the compounds during sterilization.

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RELATIVE RESISTANCE OF DIPLOID AND TETRAPLOID PLANTS OF *CATHARANTHUS ROSEUS* TO DIEBACK DISEASE

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CATHARANTHUS ROSEUS, also known as *Vinca rosea* or periwinkle, is an important medicinal plant. Alkaloids like vincristine, vinblastine, ajmalicine and serpentine extracted from this plant are used to treat human neoplasms and hypertension. This plant is generally free from pests and diseases. However, in recent years, a dieback disease caused by *Pythium butleri*[1] has extensively damaged this crop during the rainy season especially in and around Bangalore. Commonly used fungicides like Dithane Z-78, Cuprasol, Bavistin and Benlate failed to effectively control this disease.

As part of the genetic improvement programme on this crop, tetraploids were developed. In October 1982, 242 C_2 generation tetraploids and 149 diploids were individually randomized in the field to study the tetraploids. The plants were 3-months old during transplantation in the field. A severe epidemic of *dieback disease occurred following heavy rains* between 2 and 13 June 1983. All the plants were scored for disease severity on 21 June 1983. The disease incidence and plant mortality were recorded in diploids and tetraploids. There were distinct differences between diploids and tetraploids for their reaction to dieback disease (table 1). The tetraploids were about 8 times more resistant than the diploids. There was no mortality in tetraploids while about 42% of the diploids were killed during the epidemic. Although tetraploids had basically a susceptible reaction type, the disease severity in tetraploids was considerably less than that in diploids indicating that the resistance may be horizontal[2] in nature. The resistance of the tetraploids to dieback disease appeared to increase with increase in the age of plants (unpublished data). These

Table 1 *Disease incidence, disease severity and plant mortality in diploids and tetraploids of C. roseus.*

Observation	Diploids	Tetraploids
Disease incidence (%)	100.0	75.6
Disease severity (%) Mean	84.6	10.9
Range	15–100	0–6
Plant mortality (%)	42.3	0.0

observations suggest the possibility of controlling dieback disease using tetraploids of *C. roseus*.

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EMERGING SYNTHETIC BLOOD SUBSTITUTES-PERFLUROCHEMICALS

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ADEQUATE supply of blood products has always been a difficult problem at the Indian Hospitals. This problem has been aggravated in recent years by the enormous increase in demand and the alarming knowledge on blood transmitted diseases, such as hepatitis and acquired immunodeficiency syndrome (AIDS). It is therefore not surprising that the search for blood substitutes which dates back to the early part of the century, has acquired fresh urgency. The advent of perfluorochemicals as a synthetic blood substitute assumes particular importance in this context.

Since the classic observation in 1966 by Clark and Gollan[1], that mice submerged in a beaker of perfluorocarbon could survive, because of the bioavailability of dissolved oxygen, the interest in perfluorocarbons as possible blood substitutes has grown. Perfluorocarbons are fluorinated aromatic and aliphatic organic chemicals in which the reactive hydrogen groups have been replaced by non-reactive fluoride ions (figure 1). This structure enables them to dissolve large quantities of gases such as oxygen, carbondioxide and carbon monoxide. They also have low surface tension, high mobility and a high degree of clarity.

The oxygen transporting property of these compounds is however limited at ambient pressures. In

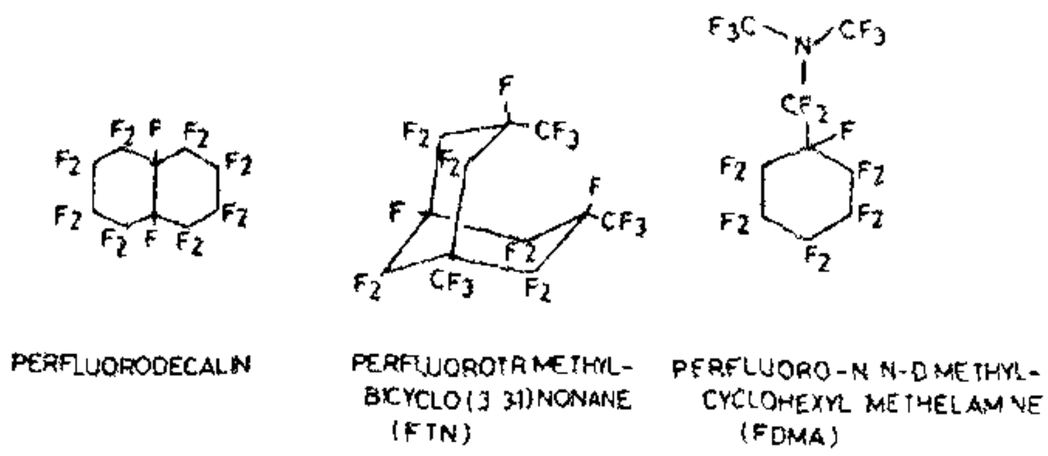

Figure 1. Chemical structure of perfluorochemicals

blood, the oxygen dissociation curve of haemoglobin is sigmoid with respect to oxygen, whereas in perfluorocarbons it is linear[2] (figure 2). Blood delivers 5 to 9 volume percent oxygen to tissues at ambient pressures, whereas at the same pressures, fluosol-DA 20% (an aqueous emulsion of perfluorodecalin and perfluorotripropylamine with other ingredients) can only deliver about 1 to 2 volume percent oxygen[3].

These chemicals have a finite life span intravascularly. In spite of the short intravascular life, they tend to be deposited in tissues, making long term use impossible[3]. Adverse reactions like transient hypotension and pulmonary infiltrates have been reported in some human trials[4]. However, 181 patients treated in Japan with fluosol-DA have not demonstrated any adverse reactions[5]. Large doses of perfluorochemicals have also been found to cause reticuloendothelial blockade leading to immuno depression[6].

Another great drawback of fluosol is that it must be

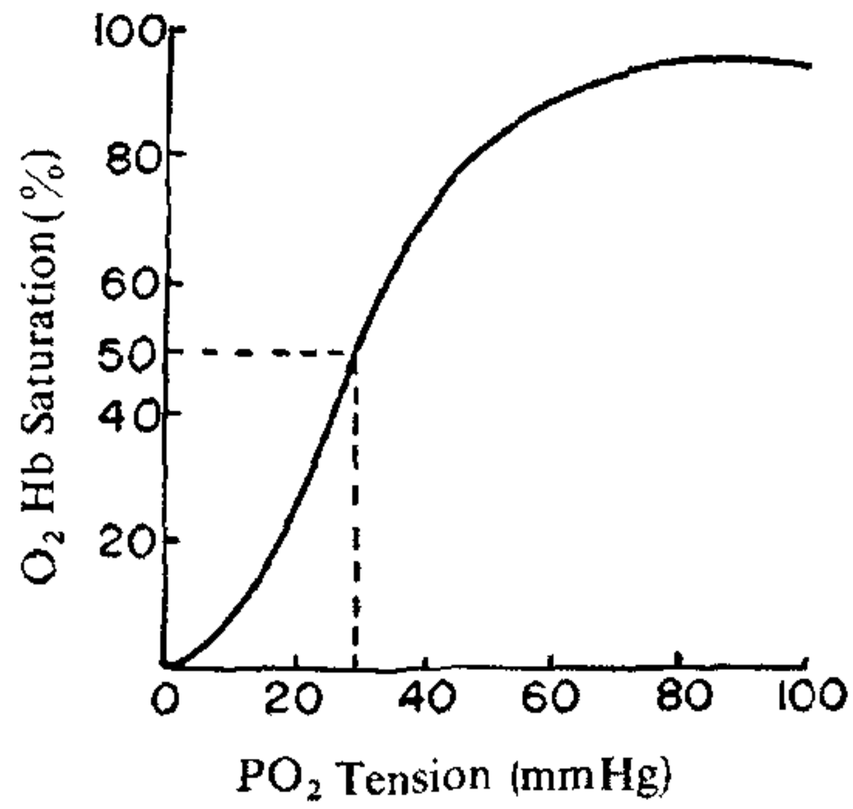

Figure 2. Oxygen dissociation curve of Haemoglobin