5.1 INTRODUCTION

The pigeon pea, *Cajanus cajan* (L.) Millsp., also known as red gram, is found throughout tropical and subtropical areas of the world, from about 30°N to about 30°S of the equator. There is some uncertainty about the origins of the pigeon pea, and although it is believed to have originated in India, it is found very extensively in Africa (Duke, 1981). Greater use of the pigeon pea as food, is made in India than in most other parts of the world. In India, it is split and skinned into dhal which is relished as excellent food. According to Duke (1981), preparation of dhal involves sun-drying, followed by partial splitting of the seeds by a stone mill. The seeds are then treated with a vegetable oil and stored. During storage, oil is absorbed by the seed coat, which facilitates its final removal. The resulting product is sieved and winnowed to remove any residual seed coats, has an excellent half-globular shape, cooks soft and commands a high price. It may also be cooked and eaten in the green form, or as dried red gram. In West Africa, the mature seeds are soaked in water, cooked and eaten alone or with rice, yam or a variety of vegetables. In the Caribbean, pigeon peas may be harvested green, cut, steamed and canned or as dry seeds, cooked and canned for export. For domestic use, the peas are harvested green or dried and used in a variety of local dishes. Estimates of dry seed yield are in the range 400–600 kg/ha in Africa, 700 kg/ha in Asia and about 1400 kg/ha in North America, whereas green pod yields are estimated at between 1000 and 9000 kg/ha (Duke, 1981).

Pigeon pea and chickpea are the most important pulses of the
developing countries. The Indian subcontinent produces about 90% of the world’s supply of pigeon pea, the remaining 10% being produced in Africa and the Caribbean (Kanwar, 1987). Appropriately therefore, a great majority of the research into pigeon pea production and utilization occurs in the Indian subcontinent in universities and institutes, such as The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

In Africa, pigeon pea is an important field crop in Kenya, Malawi and Uganda and to a much smaller extent in other African countries. Pigeon pea is considered to have great potential as an important grain legume for human nutrition, in many protein-deficient tropical countries. Because of its potential as a protein supplement to cereal-based foods, the Protein Advisory Group (PAG) of the United Nations recommended that urgent attention be paid to research into the production and nutritional evaluation of pigeon pea and seven other grain legumes (PAG, 1972). Although cowpeas and other beans are the legumes of choice, pigeon pea has the potential to become an important dietary legume because of its relatively cheaper price in comparison with cowpeas. This is indeed happening in Nigeria, Ghana and other West African countries, where the rural and urban poor have turned to pigeon pea for part of their dietary protein requirements. In parts of Nigeria, pigeon pea is referred to as the ‘poor man’s cowpeas’.

Considerably less research attention has, however, been paid to pigeon pea than most of the other grain legumes notably, soybean, cowpea, peanut, dry bean, broad bean and chickpea. The nutritional value of pigeon pea has been much less studied than the agronomy of the legume. In fact, most research on pigeon pea has concentrated on breeding and other aspects of legume production, to the almost total exclusion of nutritional evaluation.

5.2 NUTRIENT COMPOSITION AND NUTRITIVE VALUE

Studies on the chemical composition of pigeon pea (Mtanga and Sugiyama, 1974; Singh et al., 1975; Deosthale and Rao, 1981) indicate that variety has a significant influence on chemical composition. Deosthale and Rao (1981) found that among varieties, protein content varies from 19.8% to 23.6%, methionine from 1.2% to 1.9% and tryptophan from 0.43% to 0.62%. From a study of amino acid composition of East African legumes Mtanga and Sugiyama (1974) found that pigeon pea is limiting in methionine and tryptophan. Based on calculation of protein content and protein scores, these workers rank pigeon pea ahead of cowpea, but behind soybean in nutritive value. Nutrient profiles of dehusked, mature seed and immature seed vary quite distinctly, apparently depending on the maturity of the seed. Moisture content is