

## BRISTLED CUMBU (PEARL MILLET)

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The earhead of *cumbu*, the pearl millet (*Pennisetum typhoides*, Stapf and Hubbard) is composed of a number of fascicles serially disposed along a central rachis. Surrounding the spikelets in each fascicle is a whorl of 30—70 (average 40) free bristles. One of these bristles is thicker and longer than the rest and is called the "principal" bristle.<sup>1</sup> The morphological nature of this principal bristle has been discussed elsewhere and set down as the prolongation of the fascicle axis.<sup>2</sup>

The earhead of the commonly cultivated *cumbu* has a smooth surface and can be called bristle-less, the principal bristle keeping down to the grain surface. In *P. leonis*, a form of this millet from Sierra Leone, the bristle is even below the grain surface, so that the grains touch each other so closely as to give a very packed earhead.<sup>3</sup> A third condition is met with in a few varieties which are noticeably bristled. (Vide illus.) Bristled *cumbu* is much in demand for the reputation that it has for keeping off birds from pecking the grain. Bristled varieties are not very common in South India though in odd places in and outside this presidency there exist bristled forms.

To study the inheritance of this bristled condition, some bristled varieties were got down. Of these *P. echinurus*, an African species is "very bristly".<sup>4</sup> Its bristles measure on an average 2 cm. beyond the grain surface. Its chief disability is the tendency to shed spikelet whorls and this weakness might have militated against the perpetuation of very bristly types as economic varieties. That the reduction in bristles, both in number and in length, has kept pace generally with the packing of the grains on the earheads will be obvious from *P. leonis* which has the densest ear and the shortest bristles. Counts of fascicles and grains on a 2 inch length, an inch above the base of the earhead, of similar sized earheads (5 in each) have given on an average 943 fascicles and 1,521 grains for *P. leonis* and 502 fascicles and 1,028 grains for *P. echinurus*. It looks as if the spike-like disposition of the fascicles and the accommodation of both the grains and the obtrusive bristle brush on them, cannot go together with advantage.

These two species represent extremes in the length of the principal bristle and are constant in their expression. In order to get some idea of the genetic relationship of these two classes of bristles, "suppressed" and "very bristly", crosses were made between *P. leonis* and



*P. echinurus* and the  $F_1$  was very bristly. In the  $F_2$  there was a segregation for bristles, visible and suppressed. The lengths of the visible bristles ranged from short to medium and on to "very bristly". The groups ran one into the other so much that a sharp separation was not possible. All the visible bristles were, therefore, grouped together. The segregations obtained are presented below,

Cross No.	$F_2$ Family Nos.	Segregation for bristles	
		Visible.	Suppressed.
P. T. VI.	P. T. 604	82	30
	" 607	107	35
	" 608	108	35
	" 609	105	33
	" 610	98	28
	" 612	124	31
P. T. IX.	" 616	78	25
	" 619	100	29
	" 620	44	16
Total		846	262
Expected 3 : 1		831	277
		$X^2 = 1.08 \quad P > .05$	

Though difficult of sharp classification through definite counts the bristled group could be broadly classified into full, medium and short. The average number of fascicles and grains in a 2 inch length in four typical earheads in each class of bristle length at corresponding portions, is given below.

Earheads with			Number of	
			Fascicles.	Grains.
Full bristle.	...	...	731	617
Medium bristle.	...	..	895	1231
Short bristle.	...	...	981	1419
Suppressed bristle.	...	...	1156	1702

The above figures show that with the reduction in the bristle length the earheads get denser in fascicles and grains until in the heads with suppressed bristle they are at a maximum. The reduction in the number of grains per fascicle in the full bristle group is very significant.

In the collections of *cumbu* at the Millets Breeding Station there were some from Bellary (*P. typhoides*, Stapf and Hubbard) that had small bristles. These occurred in a population in which the bristles were suppressed. The slight bristled heads bread true and had non-shedding fascicles. Counts were taken in 2 inch lengths at similar positions in both the groups of earheads and the following average numbers of fascicles and grains were obtained.

Bellary Sajja (*Cumbu*).

	Suppressed bristled.	Slightly bristled (0.5-1.0 cm.)
Number of fascicles	567	435
Number of grains	1189	828



It will be seen that though there is no shedding with the shortening of the bristle, the obtrusive bristles have affected grain density in the earheads.

*P. echinurus* is said to be "bird-resistant, the bristles pricking the eyes of birds which attempt to extract the seed from the heads";<sup>4</sup> and this has been the experience with this millet at the Millets Breeding Station, Coimbatore. Its chronic shedding, the long thick bristle and the associated vigour of the other minor bristles of the whorl and the consequent reduction in the number of grains (which is the all important end in view) militate against its spread as a cultivated variety, however desirable and helpful, the long bristle may be. It is, therefore, not surprising that through the selective forces of man exercised in the course of centuries the very short and suppressed-bristled and denser headed forms have formed the predominant group among the cultivated *Pennisetums*. Breeding to avoid the scaring of birds is thus beset with other economic disabilities.

**Summary.** Bristled earheads of *cumbu* help in preventing birds from pecking the grain. In the varieties studied, the longer the bristle, the greater the shedding of the fascicles and the lesser the density in the packing of the grain. The condition in which the bristles are suppressed in expression and remain below the grain surface is recessive to that in which the earheads show bristles of lengths from short to full.

#### References.

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3. do. and P. V. Hariharan. (1935). *Mad. Agric. Jour.* 23, 418.
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## CATTLE IMPROVEMENT IN COIMBATORE DISTRICT

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One of the quickest methods of improving cattle is to arrange for the supply of a sufficient number of high class bulls. These mated with good cows will further improve the stock and when mated to cows of poor quality and mixed parentage will grade up the stock considerably in a few generations. The improvement of stock is a long term process and consequently calls for well-laid plans which will be continued over a period of at least 15—20 years.

The problem of bull supply resolves itself into three major parts. Firstly, the supply of bulls, secondly the cost of purchase of bulls and their distribution and thirdly the maintenance of the bulls during the years when they are at stud.

**Supply of Bulls.** Coimbatore district is fortunate in that it possesses a suitable and hardy breed of cattle—Kangayam—and a master in the art of breeding in the Pattagar of Palayakottai.