Definition of Triage Components in Indian Plantation Coffee

BY

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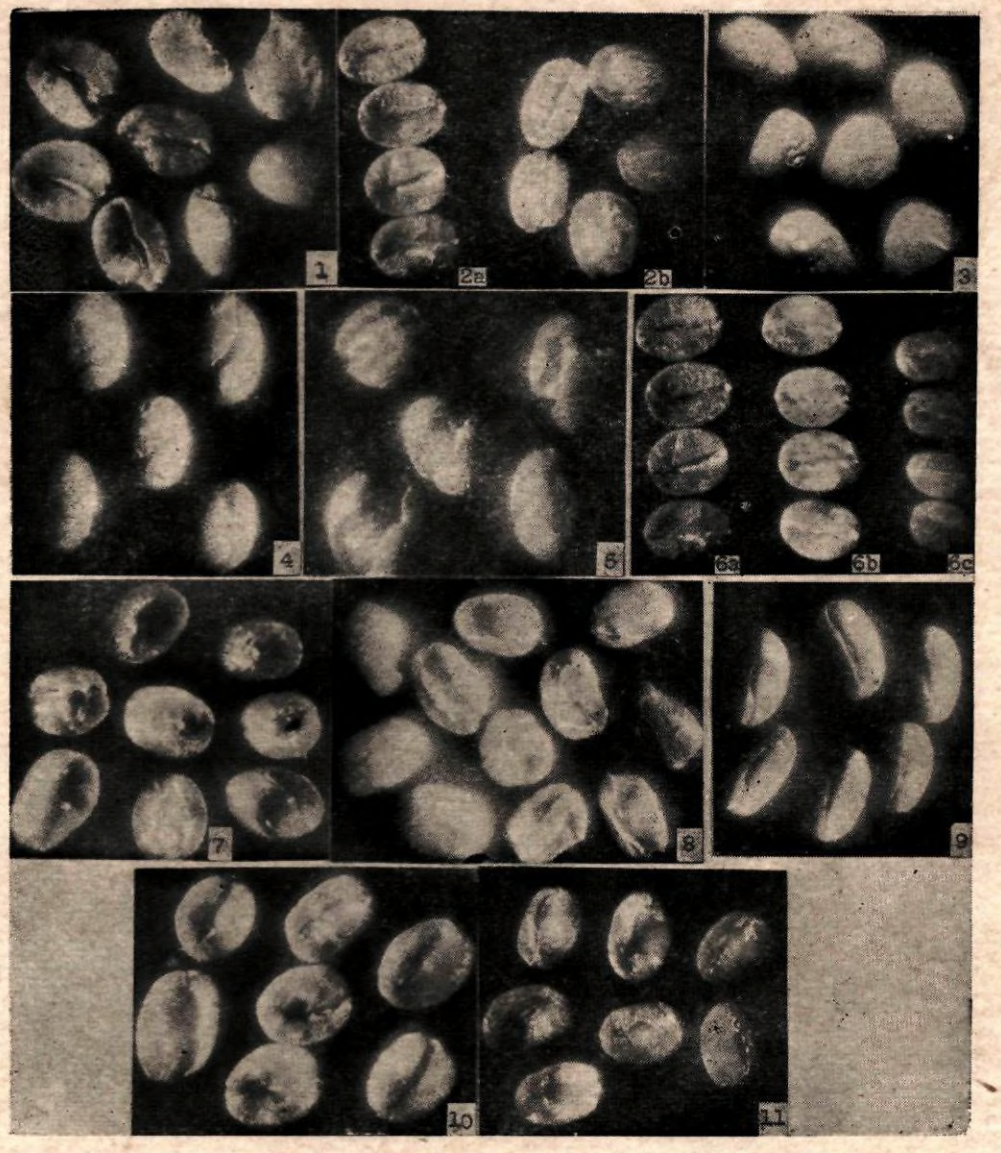

1. Broken beans
2. (a) and (b) Normal and withered beans respectively
3. Spotted beans
4. & 5. Elephant beans. In Fig. 5 parts are separated
6. (a), (b) and (c). 'A' and 'B' grades and small beans respectively
7. Hollow beans
8. Distorted beans
9. Triangular beans
10. Beans showing gaping central groove
11. Beans with central groove shifted to edges

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I. Introduction

RIPE coffee fruits are processed by the 'wet method' on estates in India to produce parchment coffee. This is then despatched to factories called Curing houses for further processing. In the factories the parchment is peeled, and clean coffee obtained — plantation coffee, is graded by machinery. Peaberry, A, B, CT, Blacks and Bits are the grades separated.

A characteristic feature of Indian Coffee is the process of rigorous hand garbling at the factories. The common practice is to give the workers, usually women, a specified quantity as task work which they have to complete in a work day. The workers may use standard small hand sieves to sieve the peaberry, A and B grades and then garble to remove any triage (CT), blacks and bits still included in these. Generally the workers garble all beans that are considered by them as not conforming to the type of the particular grade which they are garbling at the moment.

II. Standards for Grades

Standards have been fixed for grading. The standards which were brought into use from 1958-59 season are given below (Coffee Board, 1958 and 1960):

Arabica Plantation Coffee

Grading:

1 Plantation 'A': 90% by weight shall stand on a sieve with round holes of 6·65 mm. Not more than 1½% by weight shall pass through a sieve with round holes of 6·00 mm.

2 Plantation 'B': At least 75% by weight shall stand on a sieve with round holes of 6·00 mm. Not more than 1½ % by weight shall pass through a sieve with round holes of 5·50 mm.

Flats shall not contain 'PB' subject to a tolerance of 2% by weight.

3 Plantation 'PB': 'PB' shall not contain flats, subject to a tolerance of 2% by weight.

4 Plantation Bulk: Tolerance of triage 12% by weight.

TOLERANCE IN GARBLING—by weight

2% 'Peaberry Tr' in PB.

2% Triage in 'A'

3% Triage in 'B'

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Definition of Certain Grades

(i) **Triage**—Broken, Withered, Spotted, Elephant, Small, Discoloured and Malformed beans (Pales and pulper cuts are also included). Triage shall be free from BLACKS, Stinkers and Sours.

(ii) **Bits** — Broken coffee of less than 1/3rd of a bean size.

(iii) **Blacks** —More than half of surface black, blue, brown or similarly discoloured (Coffee Board, 1960).

(iv) Stinkers are "usually beans which have been left in tanks or channels from previous preparation". (Devonshire, 1949).

(v) 'Sour' is a term used in describing liquor. "Unpleasant flavour, suggestive of rotting coffee pulp, also suggestive of Mbuni (cherry) flavour.

"Caused by faulty factory work–improper fermentation resulting in a continuation of the fermentation process during the earlier stages of drying. Excess drying causing a heating of the coffee. Excess fermentation with many skins. Discoloured pulper nipped beans a frequent cause". (Devonshire, 1949).

Penalties are leviable for including excess triage in Peaberry, 'A' and 'B' grades than tolerance limits fixed–(Coffee Board, 1960).

III. Need for defining Trige components

Components included in Triage have been specified; but, none of these components have been either described or defined. It is possible that this may result in 'erring on the safer side' in garbling – removal of beans which may otherwise be fit to be retained.

During work on the study of triage in Station selections, it was felt that definitions could be offered for each of the components included under triage. This paper is an attempt in this direction.

IV. Definition of defective beans in other coffee Growing Countries

Defining of defective beans is nothing new. It is practised in other coffee growing countries as in Brazil, Central American countries, East African territories, and Congo. In some of these countries specified units of the grades are analysed for the total number of defective beans included, each type of defective bean, well described, is given marks and the aggregate of the marks evaluates the sample under test (Rene Coste, 1959; Piellard, 1958). Proper definition of the defective beans is a valuable guide to denote the beans that require to be removed on account of their defects from the superior grades and make these latter more attractive on the selling table.

V. Definition of Triage in Indian Plantation Coffee

Following definitions for the components of triage in Indian Plantation coffee are offered.

1. **Broken**: Since broken beans of less than 1/3rd of a bean size are defined as bits, excluding this, all other beans either cut mechanically or broken during the processing stages are included in this category (Broken beans). Pulper cuts are also included in this; these "are sometimes discolured because of oxidization during fermentation". (Haarer, 1958).

All beans broken mechanically during processing and which are over 1/3rd of a bean size are broken beans (Fig. 1).

2. **Withered**: These beans look thin and wrinkled and show lack of full development. Generally they have tightly adhering silverskin and give a dried up appearance without the normal sheen or shine.

All beans appearing thin, ragged, wrinkled, and, dried up are withered beans (Fig.2).

3. **Spotted**: This includes beans with spots on the surface which may be caused either by hail or insect or fungal agencies or indicate stages in black bean formation. The spots may be from pinhead size to larger dimensions and one or more per bean.

All beans in which less than half of the surface of the bean is black, blue, brown or similarly discoloured are spotted beans (Fig. 3).

4. **Elephant**: These are due to false-polyembryony an account of which in the same parchment cover several endosperms, generally two, develop. They are either lying side by side inside the parchment cover or interlocked and in the peeler, sometimes, they may be separated each giving the appearance of partitioned beans. They may separate at roasting (Swynnerton *et al*, 1948). These are also called monstrous or shell beans (Jaime Castillo, 1960).

Elephant beans are misformed beans having two or more parts which are either closely fitted into each other and may separate in the peeler or on roasting (Fig. 4, 5).

Frequently, all out-standingly large beans found among 'A' grade are removed during garbling under this category even though they may be wholesome good beans. These could be separated and put in a class by themselves such as 'AA'. This necessitates fixing an upper iimit for sizing 'A' grade which is not in vogue at present.

5 **Small**: These are beans which previously used to be classified as 'C' grade or still smaller.

All wholesome good flat beans which pass through the sieve separating 'B' grade are small beans (Fig. 6).

6. **Discoloured**: This includes all such beans that do not possess the normal colour-grey, bluish grey, bluish, etc., characteristic of coffee of any particular district. Foxy *i.e.*, beans with rust-red tinge due to harvesting over-ripe fruits, under or prolonged fermentation of the parchment and, insufficient washing; beans with a blotchy appearance due to defective drying; whitish beans of spongy texture and musty appearance due to humidity factors in storage greens due to unripe fruits getting pulped and defective drying; dull and faded beans-pales, due to processing defects; and yellowish or amber coloured beans are included in this category.

All such beans *e.g.* foxy; blotchy appearance; whitish; musty and of a spongy texture; greens; pales and yellowish or amber colour, that do not possess the normal colour-grey, bluish-grey, bluish etc., characteristic of coffee of any particular district are discoloured beans.

7. **Malformed**: A number of types of beans go into this category as defined below:

(i) **Hollow beans**: These are due to incomplete development of endosperm occurring in the initial or subsequent stages resulting in a depression or crevice in the flat side of the bean of varying extent – from a small cavity in the centre to a pan shape of the full bean without a central groove (Fig. 7). Constitutional and environmental factors are involved in its development.

(ii) **Boat shape**: As the name indicates the bean becomes boat shaped on account of the two ends of the bean in the long axis curving upwards. This is a defect due to environmental factors inclusive of nutritional or defective drying.

(iii) **Distorted**: Beans with ridges or furrows resulting in uneven surface and distorting the normal shape of the bean (Fig. 8).

(iv) **Triangular**: When the ovary normally bilocular, has three or more beans, these take an appearance approximating to a spindle and usually show three angled feature (Fig. 9).

(v) **Gaping Central groove**: The groove in the centre of the bean is wide open and not tight (Fig. 10). This is again a defect in endosperm development due to environmental factors.

(vi) **Central groove dislocated** : Flat beans in which the central groove is shifted towards the extreme edge resulting in a lopsided bean (Fig. 11).

Hollow beans, boat shaped, distorted, triangular, beans with widely open central groove, and beans which are lopsided due to central groove shifting towards the extreme edge are malformed beans.

VI. Inspection of Triage

According to existing arrangements "it is proposed that Assistant Coffeee Marketing Officers should occasionally test check and report whether the grading and garbling of other grades of plantation coffee (other than 'A' grade) in their divisions conform to the standards prescribed by the Board. It is proposed that ten outturns should be checked either while drawing samples for assessment or at the time of inspection of pool warehouses whichever is convenient. All the grades of plantation coffee for which standards are prescribed except plantation 'A' should be cheked for grading and garbling." (Coffee Board, 1960). It would be desirable to enforce a more effective check. Triage samples may be drawn on similar lines to plantation 'A' and assessed by a panel of assessors. Any excess removals of good sound beans and their inclusion under 'T' may also be penalised by prescribing tolerance limits for such inclusions.

VII. Concluding Remarks

It is a point for consideration whether and to what extent quality in the cup of elephant, small and malformed beans differs from either 'PB', 'A' or 'B' grades. It is evident that their inclusion in the latter three grades may make these look un-uniform and thus detract their value from the physical standards. Indications from cup tests are that there are not wide differences in cup quality of 'T' and 'A' grades. From preliminary studies at the Central Food Technological Research Institute, Mysore, in testing 'B', 'CT', blends containing 70% 'B' and 30% 'CT' or 30% 'B' and 70% 'CT', it is reported that, "The blends under study roasted satisfactorily in the roaster. The roasting loss ranges from 17 to 19%. No significant difference could be observed in the percentages of water extract among the blends and plantation B or CT grades from the same region. In the aroma test the preference was observed to shift from B to CT or blends depending on the regions (from where samples originated); in some cases pure B grade was preferred to CT and in others CT was preferred to blend. It will be interesting to investigate the reasons for such shift in preference by the judges. As far as the taste was concerned, the blend was generally preferred to either B or CT grade." (Coffee Board, 1959-60). In these days when instant coffee is coming into prominence as well as retail powder trade, it would be desirable to know whether these types of beans under consideration–Elephant, Small and Malformed, may not be separated and sold to better advantage. Such procedures are in vogue in other countries and one could draw information from their experience (Piellard, 1958).

It is frequently seen that the price realised for 'T' is high. The overall mean average of prices secured in pool sales from 1958 to 1961 indicate a difference ranging from Rs. 20.26 to Rs. 28.47 per 50 kilos between 'A' and 'T'. (Ind. Cof., 1960 and 1962). The trade thus appears to have realised the good qualities of 'T' either in the cup or otherwise. It would be desirable to know which particular components of 'T' in Indian plantation coffee plays a decisive part in this and to what extent these can be separated and classified to better advantage.

VIII. Acknowledgements

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