

SOME PHYSICAL PROPERTIES OF 116 BANGLADESHI TIMBERS

**BULLETIN
7
WOOD SEASONING
SERIES**

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CHITTAGONG**

June, 1981

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Introduction

There are several hundred timber species in the forests and village groves of Bangladesh. The technological properties of a limited number of them are known and are being extensively used. The information on properties of most of the species are lacking, and consequently, these species are either being misused or wasted. The problem is becoming acute since the conventional timber species for a particular use are getting scarce due to unscrupulous uses of these timbers. It is, therefore, imperative that some fundamental physical properties be determined immediately in order to facilitate at least the initial selection of timbers for specific and uses.

The specific gravity or the density is an important property of an individual species based on which the utility of timber can be judged since it has a close and in many cases, a direct relationship with other wood characteristics. Density and shrinkage of 21 indigenous timber species were determined at the Institute (Sattar et al 1980). Equilibrium moisture content is also an important feature which helps in assessing the dimensional stability of timber. The specific gravity and equilibrium moisture content are thus considered to be important physical properties and so were studied.

Materials and Method

One hundred and sixteen timber species of Bangladesh were selected on the consideration of availability both in the forests and in other sources. The rest of the timber species are sparsely scattered and their individual available quantity is too meagre to be of any commercial importance.

The specimens were collected from the wood herbarium of the Institute to ensure the correct species. Three defect-free specimens from the heart wood, 3 inch \times 2 inch \times 0.50 inch dimension, were taken up for the investigation. They were dried to about 12 per cent moisture content and were dressed in all faces. For equilibrium moisture content study, the specimen were hung in a specially designed wooden rack placed inside a shed to simulate conditions as prevalent inside a house. The specimens were first exposed in the month of January, 1980 and weight of each specimen was taken at intervals of one month till December, 1980. Weight of the individual specimens were used to determine moisture content values at different instant of times. At the end of one year exposure period, the specific

gravity values were determined from these specimens based on volumes at air-dry (12% moisture content) and oven-dry conditions. The air-dry volume was calculated from the direct measurements of the dimensions of the specimens with a micrometer gauge. For oven-dry volume, these specimens were first dried in an oven at $103^{\circ} \pm 2^{\circ}\text{C}$ for 24 hours. The specimens were next coated with paraffin wax and the volume was determined by the Water Displacement Method. The specific gravity measurement was taken in metric units and so the specific gravity values correspond to the density values of woods.

Results

Table 1 shows the specific gravity values of timber of all the species. Timbers have been classified into four groups, viz., light wood, moderately heavy wood, heavy wood and very heavy wood on the basis of specific gravity. From these values, weights of wood pound per cubic foot and kilogramme per cubic metre have been calculated and the figures are incorporated in the same Table.

Equilibrium moisture content values of timbers are presented in Table 2. Timbers have also been grouped into three classes, viz., stable, moderately stable and unstable based on the moisture content fluctuation throughout the year.

It may be mentioned here that this study was conducted, of necessity with a limited number of specimens. The physical properties may not thus be true representative of the species. The values should, therefore, be taken as indicative only.

TABLE I

SPECIFIC GRAVITY AND WEIGHT OF BANGLADESHI TIMBERS

(a) Light wood (Airdry specific gravity up to 0.50)

| Timber | | Specific gravity on | | Weight of timber (at 12% mc) | |
|--------------------|--------------------------------|-------------------------------|-----------------------|------------------------------|-----------------------|
| Local name. | Botanical name. | airdry (12% mc) volume basis. | ovendry volume basis. | per cubic foot (lbs). | per cubic metre (kg). |
| 1 | 2 | 3 | 4 | 5 | 6 |
| Amra, piala | <i>Spondias pinnata</i> | 0.25 | 0.29 | 17.47 | 279.8 |
| Assar | <i>Microces paniculata</i> | 0.50 | 0.52 | 34.9 | 559.0 |
| Banderhola, Kacha | <i>Duabanga sonneratioides</i> | 0.49 | 0.52 | 34.2 | 547.8 |
| Banspata, Jisari | <i>Podocarpus neriifolia</i> | 0.50 | 0.54 | 34.9 | 559.0 |
| Barela, Jawa | <i>Holigarna caustioa</i> | 0.35 | 0.37 | 24.5 | 392.4 |
| Barun, Pithagola | <i>Crataeva adansonii</i> | 0.45 | 0.49 | 31.4 | 503.0 |
| Barta, Dewa | <i>Artocarpus lokoocha</i> | 0.48 | 0.51 | 33.5 | 536.6 |
| Boilam, Bailsur | <i>Anisoptera glabra</i> | 0.50 | 0.54 | 34.9 | 559.0 |
| Chamfata, Bolas | <i>Sapium baccatum</i> | 0.40 | 0.42 | 28.0 | 448.5 |
| Chapalish, Chambal | <i>Artocarpus chaplasha</i> | 0.48 | 0.53 | 33.5 | 536.6 |
| Chhatim, Chhatian | <i>Alstonia scholaris</i> | 0.29 | 0.31 | 20.3 | 325.2 |
| Chundul, Mainakat | <i>Tetrameles nudiflora</i> | 0.38 | 0.41 | 26.6 | 426.1 |
| Dhup | <i>Canarium resiniferum</i> | 0.48 | 0.52 | 33.5 | 536.6 |
| Dumur | <i>Ficus roxburghii</i> | 0.39 | 0.42 | 27.3 | 437.3 |
| Gamar, Gamari | <i>Gmelina arborea</i> | 0.46 | 0.50 | 32.1 | 514.2 |

TABLE 1--Contd.

(a) Light wood (Airdry specific gravity up to 0.50)—Contd.

| 1 | 2 | 3 | 4 | 5 | 6 |
|-----------------------------|-----------------------------------|------|------|-------|-------|
| Gewa | <i>Excaecaria agallocha</i> | 0.40 | 0.43 | 28.00 | 448.5 |
| Gondroi, Kosturi | <i>Cinnamomum ceoidodaphne</i> | 0.45 | 0.48 | 31.4 | 503.0 |
| Hijal | <i>Barringtonia acutangula</i> | 0.46 | 0.49 | 32.1 | 514.2 |
| Kadam | <i>Anthocephalus cadamba</i> | 0.38 | 0.40 | 26.6 | 426.1 |
| Keora, Kerba | <i>Sonneratia apetala</i> | 0.50 | 0.54 | 34.4 | 559.0 |
| Koroi, Chakua | <i>Albizzia chinensis</i> | 0.42 | 0.44 | 29.3 | 469.3 |
| Kurchi, Kuruz | <i>Holarrhena antidysenterica</i> | 0.45 | 0.48 | 31.4 | 503.0 |
| Mango, Am | <i>Mangifera indica</i> | 0.48 | 0.53 | 33.5 | 536.6 |
| Mahogany | <i>Swietenia macrophylla</i> | 0.45 | 0.50 | 31.4 | 503.0 |
| Menda, phuhuri | <i>Litsaea monopetala</i> | 0.42 | 0.44 | 29.3 | 469.3 |
| Narikeli | <i>Pterygota alata</i> | 0.45 | 0.50 | 31.4 | 503.0 |
| Pitali | <i>Trewia nudiflora</i> | 0.41 | 0.44 | 28.7 | 459.7 |
| Raktam | <i>Lophopetalum fimbriatum</i> | 0.49 | 0.53 | 34.2 | 547.8 |
| Rain tree | <i>Samanea samana</i> | 0.39 | 0.41 | 27.3 | 437.3 |
| Sampan | <i>Sterculia scaphigera</i> | 0.41 | 0.43 | 28.7 | 459.7 |
| Simul, Tula | <i>Salmalia malabarica</i> | 0.37 | 0.41 | 25.9 | 414.9 |
| Simul, Pahari Simul, Bon | <i>Salmalia insignis</i> | 0.42 | 0.44 | 29.3 | 469.3 |
| Sonalu Banderlathi | <i>Cassia fistula</i> | 0.50 | 0.53 | 34.9 | 559.0 |
| Toon, Suruj | <i>Cedrela toona</i> | 0.46 | 0.50 | 32.1 | 514.2 |
| Udal, Patagota | <i>Firmiana colorata</i> | 0.42 | 0.45 | 29.3 | 469.3 |

TABLE 1—Contd.

(b) Moderately heavy wood (Airdry specific gravity from 0.51 to 0.65)

| 1 | 2 | 3 | 4 | 5 | 6 |
|--------------------|---------------------------------|------|------|------|-------|
| Baen, Kala | <i>Avicennia officinalis</i> | 0.60 | 0.66 | 41.9 | 671.2 |
| Baen, Sada | <i>Avicennia alba</i> | 0.56 | 0.60 | 39.1 | 626.3 |
| Barmala, Dhalahuza | <i>Callicarpa macrophylla</i> | 0.56 | 0.61 | 39.1 | 626.3 |
| Batna, Gurja | <i>Quercus pachyphylla</i> | 0.59 | 0.64 | 41.2 | 659.9 |
| Bazna, Badrang | <i>Fagara budrunga</i> | 0.64 | 0.70 | 44.7 | 716.0 |
| Bhadi, Shil Bhadi | <i>Garuga pinnata</i> | 0.65 | 0.69 | 45.4 | 727.2 |
| Bhadi, Jial | <i>Lanea coromandelica</i> | 0.63 | 0.67 | 44.0 | 704.8 |
| Chalmoogra | <i>Hydnocarpus kurzii</i> | 0.61 | 0.65 | 42.6 | 682.4 |
| Chalta | <i>Dillenia indica</i> | 0.55 | 0.60 | 38.4 | 615.4 |
| Champa, Champaful | <i>Michelia champaca</i> | 0.61 | 0.67 | 42.6 | 682.4 |
| Civit, Amchandul | <i>Swintonia floribunda</i> | 0.57 | 0.61 | 39.8 | 637.5 |
| Dakroom, Rangkat | <i>Mitragyna parvifolia</i> | 0.60 | 0.65 | 41.9 | 671.2 |
| Haldu | <i>Adina cordifolia</i> | 0.60 | 0.65 | 41.9 | 671.2 |
| Hansak | <i>Xanthophyllum flavescens</i> | 0.51 | 0.56 | 35.6 | 570.2 |
| Hargaza, Akush | <i>Dillenia pentagyna</i> | 0.58 | 0.63 | 40.5 | 648.7 |
| Jalpai, Belfoi | <i>Elaeocarpus robustus</i> | 0.57 | 0.62 | 39.8 | 637.5 |
| Jam, Dhaki | <i>Syzygium grande</i> | 0.64 | 0.68 | 44.7 | 716.0 |
| Jam, Kala | <i>Syzygium jambolanum</i> | 0.63 | 0.65 | 44.0 | 704.8 |
| Jam, Goda | <i>Syzygium obovatum</i> | 0.56 | 0.60 | 39.1 | 626.3 |
| Jam, Nali | <i>Syzygium claviform</i> | 0.64 | 0.69 | 44.7 | 716.0 |
| Jam, Puty | <i>Syzygium fruticosum</i> | 0.62 | 0.69 | 43.3 | 693.6 |
| Jarul | <i>Lagerstroemia speciosa</i> | 0.64 | 0.68 | 44.7 | 716.0 |

TABLE 1—Contd.

(b) Moderately heavy wood (Airdry specific gravity from 0.51 to 0.65)—Contd.

| 1 | 2 | 3 | 4 | 5 | 6 |
|--------------------|---------------------------------|------|------|------|-------|
| Kainjal, Lou-Bhadi | <i>Bischofia javanica</i> | 0.60 | 0.63 | 41.9 | 671.2 |
| Kamdeb | <i>Calophyllum polyathum</i> | 0.55 | 0.59 | 38.4 | 615.1 |
| Kanak, Barak | <i>Schima wallichii</i> | 0.56 | 0.61 | 39.1 | 626.3 |
| Kanthal | <i>Artocarpus integrifolia</i> | 0.54 | 0.58 | 37.7 | 603.9 |
| Kerung, Karamjha | <i>Pongamia pinnata</i> | 0.62 | 0.68 | 43.3 | 693.6 |
| Korai, Shil | <i>Albizzia procera</i> | 0.63 | 0.66 | 44.0 | 704.8 |
| Kumbi | <i>Careya arborea</i> | 0.61 | 0.66 | 42.6 | 682.4 |
| Lali | <i>Amoora wallichii</i> | 0.51 | 0.54 | 35.6 | 570.2 |
| Minjiri | <i>Cassia siamea</i> | 0.61 | 0.66 | 42.6 | 682.4 |
| Moos, Kanakchampa | <i>Pterispermum acerifolium</i> | 0.51 | 0.56 | 35.6 | 570.2 |
| Nim, Ghoranim | <i>Azadirachta indica</i> | 0.59 | 0.65 | 41.2 | 659.2 |
| Palas | <i>Butea monosperma</i> | 0.56 | 0.60 | 29.1 | 626.3 |
| Passur, Ail | <i>Xylocarpus mollocenris</i> | 0.59 | 0.64 | 41.2 | 659.9 |
| Pitraj, Rata | <i>Aphanamixis polystachya</i> | 0.57 | 0.63 | 39.8 | 637.5 |
| Sonlu, Bon | <i>Cassia nodosa</i> | 0.61 | 0.64 | 42.6 | 682.4 |
| Tali | <i>Palaquium polyanthum</i> | 0.54 | 0.59 | 37.7 | 603.9 |
| Teak, Shegun | <i>Tectona grandis</i> | 0.57 | 0.61 | 39.8 | 637.5 |
| Telsur | <i>Hopea odorata</i> | 0.61 | 0.64 | 42.6 | 682.4 |
| Udal, Khashia | <i>Hibiscus macrophyllus</i> | 0.58 | 0.64 | 40.5 | 648.7 |
| Uriam, Jangliam | <i>Mangifera sylvatica</i> | 0.51 | 0.54 | 35.6 | 570.2 |

TABLE 1—Contd.

(c) Heavy wood (Airdry specific gravity from 0.66 to 0.79)

| 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------|--|------|------|------|-------|
| Amloki, Amla | <i>Emblia officinalis</i> | 0.68 | 0.74 | 47.5 | 760.8 |
| Arsol | <i>Vitex pubescens</i> | 0.77 | 0.85 | 53.8 | 861.8 |
| Babla, Babul | <i>Acacia arabica</i> | 0.72 | 0.77 | 50.3 | 805.7 |
| Bahera | <i>Terminalia bolorica</i> | 0.71 | 0.77 | 49.6 | 794.5 |
| Barapatta, Parul | <i>Haplophragma adeno- phyllum</i> | 0.73 | 0.79 | 51.0 | 816.9 |
| Batna, Bara | <i>Quercus spicata</i> | 0.66 | 0.73 | 46.1 | 738.4 |
| Bohal, Kalahuza | <i>Cordia dichotema</i> | 0.66 | 0.69 | 46.1 | 738.4 |
| Chickrassy | <i>Chickrassia tabularis</i> | 0.66 | 0.72 | 47.1 | 754.4 |
| Dharamara, Pahari awal | <i>Stereospermum personatum</i> | 0.66 | 0.72 | 46.1 | 738.4 |
| Garjan Baittya | <i>Dipterocarpus scaber</i> | 0.70 | 0.74 | 48.9 | 783.3 |
| Garjan, Dholi | <i>Dipterocarpus pilosus</i> | 0.65 | 0.70 | 46.1 | 738.4 |
| Garjan, Dhullya | <i>Dipterocarpus alatus</i> | 0.66 | 0.71 | 46.1 | 738.4 |
| Garjan, Kali, Tellya | <i>Dipterocarpus turbinatus</i> | 0.69 | 0.75 | 48.2 | 772.1 |
| Gazari, Porasal | <i>Milium velutina</i> | 0.69 | 0.75 | 48.2 | 772.1 |
| Goran | <i>Cerriops roxburghiana</i> | 0.76 | 0.85 | 53.1 | 850.6 |
| Haritaki | <i>Terminalia chebula</i> | 0.68 | 0.74 | 47.5 | 760.8 |
| Jam, Kharkharja | <i>Syzygium wallichii</i> | 0.67 | 0.74 | 46.8 | 749.6 |
| Jam, Khorl | <i>Syzygium syzygioides</i> | 0.72 | 0.77 | 50.3 | 805.7 |
| Kanyari, Bela | <i>Gardenia coronaria</i> | 0.67 | 0.73 | 46.8 | 749.6 |
| Kechuan, Kakra | <i>Glochidion lanceolarium</i> | 0.66 | 0.72 | 46.1 | 738.4 |
| Keyabong | <i>Carallia lucida</i> | 0.66 | 0.72 | 56.1 | 738.4 |

TABLE 1—Concl'd.

(c) Heavy wood (Airdry specific gravity from 0.66 to 0.79)—Cont'd.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------|---------------------------------|------|------|------|-------|
| Kom | <i>Nauclea sessilifolia</i> | 0.74 | 0.82 | 51.7 | 828.1 |
| Koroi, Tetuya | <i>Albizzia odoratissima</i> | 0.71 | 0.76 | 49.6 | 794.5 |
| Mahua | <i>Bassia latifolia</i> | 0.70 | 0.77 | 48.9 | 783.3 |
| Panyamala, Lukiluki | <i>Flacourtia cataphracta</i> | 0.68 | 0.75 | 47.5 | 760.8 |
| Sal, Gazari | <i>Shorea robusta</i> | 0.75 | 0.83 | 52.4 | 839.3 |
| Sidha, Tila Jarul | <i>Lagerstroemia parvifolia</i> | 0.67 | 0.73 | 46.8 | 749.6 |
| Sutagola, Mohal | <i>Vitica lanceaefolia</i> | 0.66 | 0.71 | 46.1 | 738.4 |
| Tentul | <i>Tamarindus indica</i> | 0.75 | 0.82 | 52.4 | 839.3 |

(d) Very heavy wood (Airdry specific gravity over 0.80)

| 1 | 2 | 3 | 4 | 5 | 6 |
|--------------------|-----------------------------|------|------|------|--------|
| Batna, Jat | <i>Quercus lanceaefolia</i> | 0.80 | 0.84 | 55.9 | 895.4 |
| Goda, Hariana | <i>Vitex peduncularis</i> | 0.89 | 0.94 | 62.2 | 996.3 |
| Gutguttya, Neur | <i>Bursera serrata</i> | 0.80 | 0.87 | 55.9 | 895.4 |
| Stchri, Kantakoroi | <i>Anogeissua acuminata</i> | 0.86 | 0.95 | 60.1 | 962.7 |
| Kankra, Natinga | <i>Bruguiera conjugata</i> | 0.86 | 0.92 | 60.1 | 962.7 |
| Kusum | <i>Schleichera oleosa</i> | 0.91 | 0.94 | 63.6 | 1018.7 |
| Lohakat, Pyinkado | <i>Xylia dolabriformis</i> | 0.88 | 0.97 | 61.5 | 985.1 |
| Nageshwar | <i>Mesua ferrea</i> | 0.90 | 0.94 | 62.9 | 1007.6 |
| Ping | <i>Cynometra polyandra</i> | 0.85 | 0.96 | 59.4 | 951.5 |
| Sundri, Sundari | <i>Heritiera fomes</i> | 0.96 | 1.10 | 67.1 | 1074.3 |

TABLE—2

Equilibrium Moisture Content and Grouping of Timbers on the Basis of Moisture Content Fluctuation.

(a) Stable (Moisture content fluctuation below 3.5%)

| Timber | | Equilibrium moisture content (%) | | |
|----------------------|-----------------------------------|----------------------------------|--------------------------|------------------------------|
| Local name | Botanical name | Maximum observed in June. | Minimum observed in Feb. | Fluctuation during the year. |
| 1 | 2 | 3 | 4 | 5 |
| Amloki, Amla | <i>Emblica officinalis</i> | 15.1 | 11.7 | 3.4 |
| Arsol | <i>Vitex pubescens</i> | 14.9 | 11.7 | 3.2 |
| Babla, Babul | <i>Acacia arabica</i> | 15.2 | 11.8 | 3.4 |
| Barapatta, Parul | <i>Haplophragma adeno-phyllum</i> | 16.3 | 13.1 | 3.2 |
| Batna, Bara | <i>Quercus spicata</i> | 15.4 | 12.1 | 3.3 |
| Batna, Jat | <i>Quercus lanceafolia</i> | 15.4 | 12.4 | 3.0 |
| Bhadi, Jial | <i>Lannea coromandelica</i> | 13.2 | 11.2 | 2.0 |
| Bohal, Kalahuza | <i>Cordia dichotoma</i> | 13.9 | 11.4 | 2.5 |
| Boilam, Bailsur | <i>Anisoptera glabra</i> | 16.2 | 13.2 | 3.2 |
| Chalmoogra | <i>Hydnocarpus kurzii</i> | 13.7 | 10.4 | 3.3 |
| Chickrassy | <i>Chickrassia, tabularis</i> | 13.0 | 10.2 | 2.8 |
| Gamar, Gamari | <i>Gmelina arborea</i> | 16.0 | 12.6 | 3.4 |
| Garjan, Kali, Tellya | <i>Dipterocarpus turbinatus</i> | 15.4 | 12.6 | 2.8 |
| Goda, Harina | <i>Vitex peduncularis</i> | 14.6 | 12.0 | 2.6 |
| Gondroi, Kosturi | <i>Cinnamomum cecidodaphne</i> | 15.0 | 11.7 | 3.3 |
| Gutguttya, Neur | <i>Bursera serrata</i> | 14.7 | 12.8 | 2.1 |

TABLE 2—Contd.

(a) Stable (Moisture content fluctuation below 3.5%)—Concl'd.

| 1 | 2 | 3 | 4 | 5 |
|---------------------|--------------------------------|------|------|-----|
| Haldu | <i>Adina cordifolia</i> | 14.5 | 11.8 | 2.7 |
| Jalpai, Belfoi | <i>Elaeocarpus robustus</i> | 14.3 | 11.3 | 3.0 |
| Kanthal | <i>Artocarpus integrifolia</i> | 12.7 | 10.5 | 2.2 |
| Korai, Sil | <i>Albizzia procera</i> | 12.8 | 10.2 | 2.6 |
| Kom | <i>Nauclea sessilifolia</i> | 16.3 | 13.0 | 3.3 |
| Kushum | <i>Schleichera oleosa</i> | 16.9 | 14.1 | 2.9 |
| Lohakat, Pyinkado | <i>Zylia dolabriformis</i> | 15.9 | 13.0 | 2.9 |
| Mahogany .. | <i>Swietenia macrophylla</i> | 14.8 | 11.5 | 3.3 |
| Nageshwar .. | <i>Mesua ferrea</i> | 13.6 | 11.4 | 2.2 |
| Passur, Ail .. | <i>Xylocarpus mollocensis</i> | 15.7 | 12.7 | 3.0 |
| Sal, Gazari .. | <i>Shorea robusta</i> | 14.7 | 12.1 | 2.6 |
| Sonalu, Banderlathi | <i>Cassia fistula</i> | 13.0 | 11.0 | 2.0 |
| Sonalu, Bon .. | <i>Cassia nodosa</i> | 12.9 | 10.9 | 2.0 |
| Sundri, Sundari .. | <i>Heritiera fomes</i> | 16.2 | 12.9 | 3.3 |
| Teak, Segun .. | <i>Tectona grandis</i> | 13.3 | 11.1 | 2.2 |
| Telsur .. | <i>Hopea odorata</i> | 14.0 | 11.0 | 3.0 |

TABLE 2—Contd.

(b) Moderately Stable (Moisture content fluctuation from 3·5 to 4·9%)

| 1 | 2 | 3 | 4 | 5 |
|----------------------|---------------------------------|------|------|-----|
| Assar | <i>Microcos paniculata</i> | 14·6 | 10·4 | 4·2 |
| Bahera | <i>Terminalia belerica</i> | 15·8 | 11·4 | 4·4 |
| Banderhola, Kacha | <i>Duabanga sonneratioides</i> | 15·9 | 11·4 | 4·5 |
| Banspata, Jinari | <i>Podocarpu neriifolia</i> | 17·1 | 13·2 | 3·9 |
| Barela, Jawa .. | <i>Holigarna caustica</i> | 16·2 | 11·5 | 4·7 |
| Bazna, Badrang .. | <i>Fagara budrunga</i> | 16·2 | 12·2 | 4·0 |
| Batna, Gurja .. | <i>Quercus pachyphylla</i> | 15·8 | 12·0 | 3·8 |
| Chalta .. | <i>Dillenia indica</i> | 17·6 | 13·3 | 4·3 |
| Chamfata, Bolas | <i>Sapium baccatum</i> | 15·6 | 11·0 | 4·6 |
| Champa, Champaful | <i>Michelia champaca</i> | 17·9 | 13·8 | 4·1 |
| Chapalish, Chambal | <i>Artocarpus chaplasha</i> | 15·5 | 10·7 | 4·8 |
| Chhatim, Chhatian | <i>Alstonia scholaris</i> | 14·6 | 10·6 | 4·0 |
| Civit, Amchundul | <i>Swintonia floribunda</i> | 16·9 | 12·4 | 4·7 |
| Dakroom, Rongkat | <i>Mitragyna parvifolia</i> | 17·4 | 13·3 | 4·1 |
| Dharmara, Pahariawal | <i>Stereospermum personatum</i> | 16·8 | 12·6 | 4·2 |
| Goran .. | <i>Ceriops roxburghiana</i> | 18·5 | 13·8 | 4·7 |
| Garjan, Baittya .. | <i>Dipterocarpus scaber</i> | 15·7 | 12·0 | 3·7 |
| Garjan, Dholi .. | <i>Dipterocarpus pilosus</i> | 15·8 | 12·2 | 3·6 |
| Garjan, Dhullya .. | <i>Dipterocarpus alatus</i> | 15·9 | 12·4 | 3·5 |
| Hargaza, Akush .. | <i>Dillenia pontagyna</i> | 18·1 | 13·2 | 4·9 |
| Haritaki .. | <i>Terminalia chebula</i> | 15·9 | 12·0 | 3·9 |

TABLE 2—Contd.

(b) Moderately Stable (Moisture content fluctuation from 3.5 to 4.9%)—Contd.

| 1 | 2 | 3 | 4 | 5 |
|--------------------|---------------------------------|------|------|-----|
| Hijal .. | <i>Barringtonia acutangula</i> | 17.1 | 12.5 | 4.6 |
| Itchri, Kantakorai | <i>Anogeissus ac-uminata</i> | 16.4 | 12.5 | 3.9 |
| Jam, Dhaki .. | <i>Syzygium grande</i> | 16.8 | 12.8 | 4.0 |
| Jam, Kala .. | <i>Syzygium jambolanum</i> | 16.5 | 12.2 | 4.3 |
| Jam, kharkharja .. | <i>Syzygium wallichii</i> | 17.1 | 13.4 | 3.7 |
| Jam, Nali .. | <i>Syzygium claviform</i> | 16.0 | 12.5 | 3.5 |
| Jam, Khorl .. | <i>Syzygium syzygioides</i> | 18.5 | 14.2 | 4.3 |
| Jarul .. | <i>Lagerstroemia speciosa</i> | 16.0 | 12.5 | 3.5 |
| Kamdeb .. | <i>Callophyllum polyanthum</i> | 17.2 | 13.2 | 4.0 |
| Kechuan, Kakra .. | <i>Glochidion lanceolarium</i> | 16.2 | 12.7 | 3.5 |
| Kanak, Banak .. | <i>Schima wallichii</i> | 16.3 | 12.4 | 4.1 |
| Kankra, Natinga | <i>Bruguiera conjugata</i> | 15.5 | 11.9 | 3.6 |
| Keyabog .. | <i>Carallia lucida</i> | 15.0 | 11.1 | 3.9 |
| Korai, Chakua .. | <i>Albizzia chinensia</i> | 16.1 | 11.6 | 4.5 |
| Korai, Tetuya .. | <i>Albizzia odoratissima</i> | 16.1 | 12.5 | 3.9 |
| Kumbi .. | <i>Careya arborea</i> | 16.1 | 12.5 | 3.6 |
| Lali .. | <i>Amoora wallichii</i> | 15.6 | 11.3 | 4.3 |
| Mahua .. | <i>Bassia latifolia</i> | 17.4 | 13.3 | 4.1 |
| Menda, Phuhuri .. | <i>Litsaea monopetala</i> | 15.5 | 10.6 | 4.9 |
| Minjiri .. | <i>Cassia siamea</i> | 17.5 | 12.8 | 4.7 |
| Moos, Kanakchampa | <i>Pterospermum acerifolium</i> | 17.7 | 12.9 | 4.8 |

TABLE 2—Contd.

(b) Moderately Stable (Moisture content fluctuation from 3.5 to 4.5%)—Concl'd.

| 1 | 2 | 3 | 4 | 5 |
|-------------------|---------------------------------|------|------|-----|
| Nim, Ghoranim | <i>Azadirachta indica</i> | 17.5 | 23.8 | 4.5 |
| Panyamala, Panela | <i>Flacourtia cataphracta</i> | 17.0 | 12.8 | 4.2 |
| Ping | <i>Cynometra polyandra</i> | 16.4 | 12.6 | 3.8 |
| Pitraj, Rata | <i>Aphanamixis polystachya</i> | 16.6 | 12.7 | 3.9 |
| Sidha, Tila jarul | <i>Lagerstroemia parviflora</i> | 16.1 | 12.5 | 3.6 |
| Sutagola, Mohal | <i>Vitica lanceaefolia</i> | 15.8 | 12.1 | 3.7 |
| Tali | <i>Palaquium polyanthum</i> | 18.6 | 14.4 | 4.3 |
| Tentul | <i>Tamarindus indica</i> | 17.8 | 13.0 | 4.8 |
| Toon, Suruj | <i>Cedrela toona</i> | 16.1 | 12.1 | 4.0 |

(c) Unstable (Moisture content fluctuation from 5.0 to above)

| 1 | 2 | 3 | 4 | 5 |
|--------------------|-------------------------------|------|------|-----|
| Amra, Piala | <i>Spondias pinnata</i> | 18.1 | 10.1 | 8.0 |
| Baen, Kala | <i>Avicennia officinalis</i> | 18.0 | 12.5 | 5.5 |
| Baen, Sada | <i>Avicennia alba</i> | 17.8 | 12.1 | 5.7 |
| Barta, Dewa | <i>Artocarpus lokoocha</i> | 16.5 | 11.2 | 5.3 |
| Bhadi, Shil | <i>Garuga pinnata</i> | 17.8 | 12.1 | 5.7 |
| Barmala, Dhalahuza | <i>Callicarpa macrophylla</i> | 18.0 | 12.7 | 5.3 |
| Barun, Pithagola | <i>Crataeva adansonii</i> | 18.0 | 12.5 | 5.5 |

TABLE 2—Contd.

(c) Unstable (Moisture content fluctuation from 5.0 to above)—Contd.

| 1 | 2 | 3 | 4 | 5 |
|--------------------|-----------------------------------|------|------|-----|
| Chundul, Mainakat | <i>Tetrameles nudiflora</i> | 16.3 | 11.3 | 5.0 |
| Dhup | <i>Canarium resiniferum</i> | 18.2 | 12.1 | 6.1 |
| Dumur | <i>Ficus roxburghii</i> | 17.7 | 11.3 | 6.4 |
| Gazari, Porasal | <i>Milliusa velutina</i> | 17.1 | 12.0 | 5.1 |
| Gewa | <i>Exeaeccaria agalocha</i> | 18.0 | 10.0 | 8.0 |
| Hansak | <i>Xanthophyllum flavescens</i> | 18.3 | 12.8 | 5.5 |
| Jam, Goda | <i>Syzygium obovatum</i> | 18.2 | 13.2 | 5.0 |
| Jam, Pati | <i>Syzygium fruticosum</i> | 18.2 | 12.5 | 5.7 |
| Kadam | <i>Anthocephalus cadamba</i> | 18.2 | 12.2 | 6.0 |
| Kainjal, Lou Bhadi | <i>Bischofia javanica</i> | 17.7 | 12.2 | 5.5 |
| Kanyari, Bela | <i>Cardenia coronaria</i> | 17.7 | 12.2 | 5.5 |
| Kcora, Kerba | <i>Sonneratia apetala</i> | 18.9 | 11.7 | 7.2 |
| Kerung Karamja | <i>Pongamia pinnata</i> | 18.0 | 11.4 | 6.6 |
| Kurchi, Kuruj | <i>Holarrhena antidysenterica</i> | 16.6 | 10.2 | 6.4 |
| Mango, Am | <i>Mangifera indica</i> | 16.2 | 10.5 | 5.7 |
| Narikele | <i>Pterygota alata</i> | 18.7 | 12.0 | 6.5 |
| Palash | <i>Butea monosperma</i> | 18.5 | 12.0 | 6.5 |
| Pitali | <i>Trewia nudiflora</i> | 17.9 | 11.7 | 6.2 |
| Raktan | <i>Lophopetalum fimbriatum</i> | 16.9 | 11.9 | 5.0 |
| Raintree | <i>Samanea samane</i> | 16.9 | 11.8 | 5.1 |
| Sampan | <i>Stereulia scaphigera</i> | 18.2 | 10.4 | 7.8 |

TABLE—2 *Concl.*(c) Unstable (Moisture content fluctuation from 5.0 to above)—*Concl.*

| 1 | 2 | 3 | 4 | 5 |
|-----------------|------------------------------|------|------|-----|
| Simul, Pahari | <i>Salmalia insignis</i> | 19.7 | 12.3 | 7.4 |
| Simul, Tula | <i>Salmalia malabarica</i> | 17.9 | 11.9 | 6.0 |
| Uriam, Jangliam | <i>Manifera sylvatica</i> | 16.5 | 11.0 | 5.5 |
| Udal, Khashia | <i>Hibiscus macrophyllus</i> | 18.4 | 10.4 | 8.0 |
| Udal, Patagota | <i>Firmiana colorata</i> | 18.6 | 10.8 | 7.8 |

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