

Status and Distribution of Horse-Chestnut (*Aesculus* spp.) in Kashmir Valley

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Abstract

Studies were conducted in all the districts of the valley, covering 384 sites revealed that the tree (horse-chestnut) was found growing throughout the Kashmir valley. On the basis of phenological characteristics it was found that in Kashmir, genus *Aesculus* is represented by only one species i.e. *Aesculus indica* and is commonly known as Indian horse-chestnut (Kashmiri, *Hanudun* ; Punjabi, *Bankhor*). The tree leaves are used as fodder, wood as small timber, seeds fed to cattle. The tree is also used for afforestation, and was found growing on non-agricultural lands like parks, on forest lands, as avenue cum ornamental tree in all districts of the valley at an altitudinal range of 1,545 to 2,695 m amsl. Trees were mostly young (less than 60 yr). However twenty-eight old living *Aesculus indica* trees were identified and located in different parts of the valley with maximum age of 250 yr, maximum height of 26.22 m and maximum girth of 4.75 m. The oldest living tree was found at the compound of Ziyarat Khawaja Murad Sahib Laderwan, Trehgam, Kupwara. Its age was approximately 200—250 years and a girth of about 6 m. Most of the old trees were protected in Ziyarat Sherifs (religious places). The tree is fast growing, having multiple uses, therefore can be recommended to be a potential agro-forestry tree species of Kashmir valley.

Key words : *Aesculus indica*, Status, Uses, Distribution, Old living.

The forests are the most valuable resources of the state of Jammu and Kashmir, not only in economic terms, but for their ecological and environmental value. The forests of Kashmir, which are still in relatively good shape, despite enormous biotic pressures, have shaped the lives of millions of rural folk in the state, who are still dependent on these forests for their firewood, timber, fodder and other forest products. Broad-leaved tree species are important component of Kashmir forests. They are source of fodder, fuel wood, fruits etc. in Kashmir valley. Horse-chestnut tree is one among them and belongs to the family Hippocastanaceae (syn, Sapindaceae) and genus *Aesculus* Linn. *Aesculus indica* Colebr, a common associate of temperate broad-leaved species such as *Juglans regia*, *Acer caesium*, *Prunus cornuta*, and conifers like *Abies pindrow*, *Picea smithiana*, *Taxus baccata*, *Cedrus deodara*, and *Pinus wallichiana* grows in the North-Western Himalayas (1). However, by virtue of its faster growth rate, it holds potential for mixed plantations along with spruce and silver fir in the spruce-silver fir zone. The tree provides reasonably good firewood and nuts are fed to sheep

and goats (2). The Horse-chestnut wood is mainly used elsewhere for packing cases, match splints, water troughs, planking, cooperage, platters, tea boxes, boat fittings. The pulp of this wood and other hardwoods mixed with some long fibered wood is suitable for making wrapping paper (3). The tree is having many medicinal, insecticidal and nutritional properties. An extract of leaves has been found to be useful in whooping cough (4). The wood is creamy white or pale pinkish white when freshly cut, but becomes brown on exposure, with light brown lines, the heartwood is not distinct. The timber is with a smooth feel. It is light to moderately heavy (sp gr 0.43—0.57; wt 479—560 kg/cu m), soft, straight or narrowly and shallowly interlocked-grained and sometimes waxy-grained in the radial plane and very fine and even-textured (5). The tree is among top nine most important tree species whose seed oil is used for treating rheumatic pains in Jammu and Kashmir and among them the *Aesculus indica* Colebr tree seeds find the first place (6). A recent finding has revealed that the β -aescin from the *Aesculus indica* Colebr seeds has effective anti-viral property particularly against cu-

Table 1. Phenological characteristics of Indian horse-chestnut (*Aesculus indica*) growing in Kashmir valley. Average of 100 observations.

| Tree height (m) | Tree girth (m) | Leaf size (cm) | Flower color | Fruit color | Seed coat color | Fruit size (dia) (cm) | Fruit type |
|-----------------|----------------|------------------------------------|---------------------------------|--------------------------------------|---|-----------------------|------------|
| 15—30 | 2.4—5.5 | 14—20 (length) 6—10 (width) | White with red and yellow tinge | Light brown with small green patches | White (immature) shiny chocolate brown with off white scar (mature) | 3—5 | Capsule |

cumber mosaic virus (CMV) which attacks almost all crop plants, fruit trees, leaves, seeds. The β -aescin anti viral agent is reported to control CMV upto 94% (7). An no systematic information is available with respect to horse-chestnut, its distribution, utilization in Kashmir valley, therefore the present studies were carried out.

Methods

The studies were carried out in the Faculty of Forestry, SKUAST-K, Shalimar, during 2006 and 2007. The data was collected from all the six districts of Kashmir valley and the sites were selected following multistage stratified random sampling. From each district four blocks were selected and from each block four panchayats were selected randomly for the purpose. Finally, four sites were selected from each panchayat for taking observations. In total 384 sites ($6 \times 4 \times 4 \times 4 = 384$) were selected for the study. On the basis of phenological studies, horse-chestnut species was identified and its status, distribution and concentration were recorded.

The data were collected from randomly selected four blocks in each district. The approximate altitude and the approximate number of trees existing at a given site were also recorded. The altitude was recorded with the help of Japan made Sunoh Altimeter. Following methods were also employed to collect the data from surveyed areas.

Informal Interview Method. Collection of information was done during informal interviews with the

farmers, elder and respectable citizens of the concerned areas. Generally, open-ended questions were asked for getting the information.

Transit Walk Method. Information was collected during the transit walk of the villages. Transit walk gave more scope to discuss with farmers freely in their farmlands while walking through their farms in friendly mode. Information was also collected with respect to oldest living horse--chestnut trees in the Kashmir Valley. The trees identified and information with respect to their location, approximate age, height, girth at breast height were recorded. The approximate age was determined by interviewing the senior residents of the locality. Photographs of all the identified trees were also taken.

Results and Discussion

In first instance, survey was conducted to find out and identify the number of *Aesculus* species growing all over the valley. On the basis of phenological characteristics (Table 1) genus *Aesculus* Linn., is represented by only one species i.e. *Aesculus indica* in Kashmir valley. The tree is medium to large sized with canopy round to broadly spreading, having leaf size of 14—20 cm, with white flowers having red and yellow tinge. Fruits have a diameter of 3—5 cm at maturity with brown color. The phenological observations revealed that the tree species i.e. *Aesculus indica* Colebr was same as described by Troup (1).

About 20—25 species of deciduous trees and shrubs are included in genus *Aesculus* Linn. spread

Table 2. Status and distribution of Indian horse-chestnut tree (*Aesculus indica*) in Kashmir valley on non-agricultural lands. (i.e. plantation at parks, non-forest areas, hedges, roadside).

| Name of the district | Block surveyed | Approximate altitude range (m) | Approximate no. of trees found on non-agri-land |
|----------------------|----------------|--------------------------------|---|
| 1. Srinagar | Srinagar | 1595–1630 | 108 |
| | Ganderbal | 1625–1640 | 146 |
| | Lar | 1610–1650 | 193 |
| | Kangan | 1655–2695 | 190 |
| Total | | 637 | |
| 2. Budgam | B. K. Pora | 1585–1592 | 200 |
| | Chadura | 1602–1620 | 213 |
| | Khan Sahib | 1620–1640 | 223 |
| | Nagam | 1605–1620 | 212 |
| Total | | 848 | |
| 3. Anantnag | Qazigund | 1720–1860 | 259 |
| | Qaimoh | 1645–1670 | 249 |
| | Shahabad | 1703–1740 | 248 |
| | Achabal | 1655–1660 | 228 |
| Total | | 984 | |
| 4. Pulwama | Kakapora | 1545–1600 | 228 |
| | Keller | 1755–1810 | 267 |
| | Pulwama | 1590–1612 | 141 |
| | Shopian | 1815–1920 | 165 |
| Total | | 801 | |
| 5. Baramulla | Bandipora | 1650–1665 | 189 |
| | Zaingir | 1610–1622 | 203 |
| | Tangmarg | 1995–2300 | 289 |
| | Pattan | 1590–1620 | 283 |
| Total | | 964 | |
| 6. Kupwara | Kralpora | 1610–1620 | 201 |
| | Trehgam | 1610–1627 | 219 |
| | Sogam | 1600–1625 | 224 |
| | Kupwara | 1560–1570 | 230 |
| Total | | 874 | |
| Grand total | | 5108 | |

over temperate northern hemisphere, with 7–10 species native to North America and 13–15 species native to Euroasia (1). The species of genus *Aesculus* Linn. so far reported growing in India are *Aesculus indica* Colebr, *Aesculus assomica* Griff, *Aesculus hippocastanum* Linn., *Aesculus ignarius* Linn. and *Aesculus ostreatus* Jacq (4). *Aesculus indica* Colebr (Indian Horse-chestnut) is distributed in Himalayas from Kashmir, Himachal Pradesh, Punjab, Uttar Pradesh to west Nepal; altitude ranging from 900–3,600 m.

Although number of *Aesculus* species has been recorded to occur in India and world over as early as 1921, but present survey conducted during 2006, re-

vealed that there has been no introduction of any other *Aesculus* species in Kashmir valley other than *Aesculus indica* Colebr. Therefore, all the studies conducted and presented are with respect to *Aesculus indica* tree commonly known as Indian horse-chestnut.

Earlier reports do not indicate its wider utilization in Kashmir valley, but present studies revealed that the people of valley utilize the tree and its parts. The leaves were lopped for fodder, wood being used as small timber for tool handles and branches for making charcoal. Tree was also used to stock grass to be used during winter months. Tree seeds were fed to cattle during winter months at the rate of 0.5–1.5 kg per day along with regular feed. The seeds were however, first steeped and then used so as to remove any toxins if present. The tree was also planted on large scale for afforestation purpose. Although used for multiple purposes elsewhere, but has not been exploited up to its potential in Kashmir valley.

It revealed that the tree was found to be growing in all districts of the valley viz. Anantnag, Baramulla, Budgam, Kupwara, Pulwama and Srinagar under different microclimatic, edaphic and physiographic conditions. The tree was found on non-agricultural lands like parks, as avenue tree, on village common lands, forest lands (Table 2). The tree was located at the lowest altitude (1,545 m amsl) at Lajoora (Kakapora) in district Pulwama and was also located at the highest altitude (2,695 m amsl) at Sarabal (Sonamarg) in district Srinagar. The trees were mostly of middle age (less than 60 yr) and in good condition. The tree can be recommended as an agro-forestry tree species of the valley subject to other managerial studies. So far it has not been recommended as agro forestry tree species.

An attempt was made to locate oldest living trees of Indian horse-chestnut in Kashmir valley and the information collected is presented in Table 3 and Figure 1. A total of 28 old trees were found growing in all districts irrespective of any particular location. An oldest living tree was identified and located at Ziyarat Khawja Murad Sahib Laderwan (Trehgam), Kupwara. Its approximate age was stated to be 200–250 years with girth measuring about 6.00 m and height about 30 m. Besides there were eight trees of Indian horse-

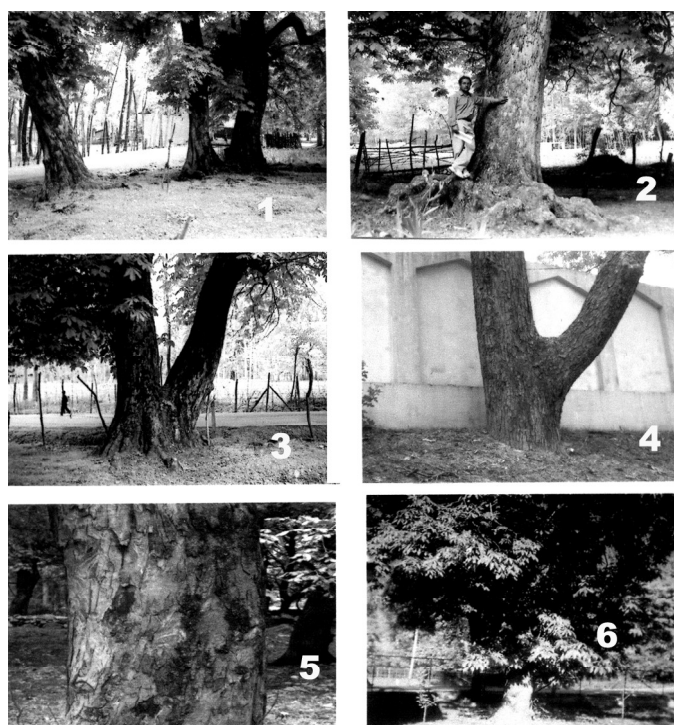


Figure 1. Old living Indian horse-chestnut (*Aesculus indica* Colebr) trees located growing in Kashmir valley. (1) Approximate age 150–200 yr, Sakhi Khawja Murad Sahib, Laderwan, Trehgam, Kupwara. (2) Approximate age 140–180 yr, Sakhi Khawja Murad Sahib, Laderwan, Trehgam, Kupwara. (3) Approximate age 200–250 yr, Sakhi Khawja Murad Sahib, Laderwan, Trehgam, Kupwara. (4) Approximate age 80–90 yr, J & K Arts Emporium, Srinagar. (5) Approximate age 60–80 yr, Village Peer Taki, Kangloora, Tral. (6) Approximate age 70–80 yr, Tourist Office, Achabal, Anantnag.

chestnut in its vicinity whose average height was approximately 26 m and average girth was 4.75 m. Other oldest trees which were found during the course

of survey were located at Achabal (4) and Khannabal (4) in Anantnag; Tangmarg, Baramulla (8); Tral, Pulwama (2) and Srinagar (1).

Table 3. Oldest living Indian horse-chestnut tree (*Aesculus indica*) found in Kashmir valley during 2006-2007.

| District | Block surveyed | Location of the tree | No. of Indian horse-chestnut trees | Approx age of tree (yr) | Av height of trees (m) | Av girth of trees (m) |
|--------------|----------------|------------------------|------------------------------------|-------------------------|------------------------|-----------------------|
| 1. Anantnag | Achabal | Achabal tourist office | 4 | 70–80 | 18 | 2.36 |
| | Khannabal | In front of army camp | 4 | 80–100 | 22.25 | 3.60 |
| | Qazigund | Could not locate | – | – | – | – |
| | Qaimoh | „ | – | – | – | – |
| 2. Baramulla | Shahabad | „ | – | – | – | – |
| | Bandipora | Could not locate | – | – | – | – |
| | Pattan | „ | – | – | – | – |
| | Zaingir | „ | – | – | – | – |
| 3. Budgam | Tangmarg | „ | 8 | 80–100 | 20.86 | 2.26 |
| | B. K. Pora | Could not locate | – | – | – | – |
| | Chadura | „ | – | – | – | – |
| | Khan Sahib | „ | – | – | – | – |
| | Nagam | „ | – | – | – | – |

Table 3. Continued.

| District | Block surveyed | Location of the tree | No. of Indian horse-chestnut trees | Approx age of tree (yr) | Av height of trees (m) | Av girth of trees (m) |
|---|----------------|------------------------------------|------------------------------------|-------------------------|------------------------|-----------------------|
| 4. Kupwara | Trehgam | Sakhi Khawja Murad Sahib, Laderwan | 9 | 200—250 | 26.22 | 4.75 |
| | Kupwara | Could not locate | — | — | — | — |
| | Sogam | „ | — | — | — | — |
| 5. Pulwama | Kralpora | „ | — | — | — | — |
| | Kakapora | Could not locate | — | — | — | — |
| | Kellar | „ | — | — | — | — |
| | Shopian | „ | — | — | — | — |
| 6. Srinagar | Pulwama | „ | — | — | — | — |
| | Tral | Kangloora Peer Taki | 2 | 60—80 | 26 | 1.90 |
| | Srinagar | J & K Arts Emporium | 1 | 80—90 | 25 | 3.14 |
| | Ganderbal | Could not locate | — | — | — | — |
| | Lar | „ | — | — | — | — |
| | Kangan | „ | — | — | — | — |
| Total number of old living Indian horse-chestnut trees in study areas | | | 28 | 60—250 yr | 18—26.22 m | 1.90—4.75 m |

The survey conducted thus revealed that the tree has existed in valley since centuries, although it has been reported since 1921 only (1). The survival of trees at Ziyarat Shariefs (religious places) indicate the reverence and regard people have for the religious places of the valley.

The studies thus revealed that the tree was found growing all over the Kashmir valley, under different micro-climatic, physiographic and edaphic conditions with various altitudes (1,545—2,695 m amsl). Though number of *Aesculus* spp. are found growing elsewhere, but in Kashmir valley only one species i.e. *Aesculus indica* Colebr was found growing. The studies further revealed that the tree has multifarious uses elsewhere, but has not been exploited up to its potential and can be recommended as an agro-forestry tree species, subject to other managerial investigations.

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