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**RESEARCH ARTICLE**

# "PRELIMINARY SURVEY OF FODDER PLANTS USED BY GOATS FROM GADCHIROLI DISTRICT OF MAHARASHTRA STATE."

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## *Abstract*

Goats are important livestock of the world and so in the Gadchiroli region which provides the localized demand of the people like meat, milk, leather and manure. Some families are having their economy depending on the goats. As the district is backward and no industrialization is in action so it becomes unavoidable to use the natural resources and make it a way for simple economy for their living and the goats are one of the better option. It is also easier to domesticate the Goats as these are simple animals and have no choosy demands for their nutrition neither they are sensitive nor weak. The current investigation deals with the feeding habits of the goats around Gadchiroli District.



## INTRODUCTION

The domestic goat (*Capra aegagrus hircus*) is a subspecies of goat domesticated from the wild goat of SouthWest Asia and Eastern Europe. The goat is a member of the family Bovidae and is closely related to the sheep as both are in the goat-antelope subfamily Caprinae. There are over 300 distinct breeds of goat. (Hirst et.. al., 2008) Goats are one of the oldest domesticated species, and have been used for their milk, meat, hair, and skins over much of the world.( Coffey et. al. 2004). Goats were the first animals domesticated by man in 10,000 B.C. (Campbell, 1981.) Most goats can be found in Asia and the Mid-East. Goats were the first animals to be used for milk by humans. (Connor, 2001.)

The demand for livestock products (meat, milk, wool, manure) is increasing day by day. Therefore it's our prime duty to document all these wild and native plants scientifically and investigate their fodder importance. It has been estimated that out of 15,000 higher plants occurring is India. 9000 are common in use, of which 7500 used as medicine, 3900 used in cultural ritual, 525 used as fiber, 400 used as fodder,300 for pesticide and insecticide,300 used for gum and resin and 100 for incense and perfumes. (Duthie,1960).

Goats are important livestock of the world and so in the Gadchiroli region which provides the localized demand of the people like meat, milk, leather and manure. Some families are having their economy depending on the goats. As the district is backward and no industrialization is in action so it becomes unavoidable to use the natural resources and make it a way for simple economy for their living and the goats are one of the better option. It is also easier to domesticate the Goats as these are simple animals and have no choosy demands for their nutrition neither they are sensitive nor weak. Whatever the plants are available to them they easily accept them and feed. But it is their good luck that the district is blessed with beautiful plant wealth so whether it is raining or summer or any other extreme season, plants are always there for them. But here our topic of interest makes its way for it.

Yes! They eat all plants but is it so? The answer is "NO"! They do not eat all plants coming their way but they are somewhat selective. They are primarily their own nutritionists. The Mother Nature has taught them what to eat, how to eat and when to eat! So the current investigation deals with the feeding habits of the goats.

The Government is providing many schemes and subsidies for goat farming to provide main as well as supplementary business to the people and many people have initiated too.

**Common Varieties of Goats in study area-**

a. Jamnabadi
b. Osmanabadi

**EARLIER WORK :**

Traditionally, indigenous fodder plants have been used to feed ruminant animal even before modern farming. As land size continued to decline, dairy production changed from extensive to zero grazing system involving growing fodders such as Napier grass and tree legumes. Local wild fodder plants provide livestock feed. BRAC (2008) reported that the indigenous knowledge was wealth on local feed and fodder systems for livestock rearing as sustainable livelihood approach. Most of them are marginal land holders and farm labors. Besides farming, cattle rearing are a promising source for their livelihood. This large population depends upon naturally available vegetation which is reducing alarmingly for want of proper knowledge and planning by the community (Dube et. al., 2012).

As the land sizes declined with increase in population pressure, livestock management system shifted from grazing animals in the paddocks to zero-grazing in early 1980s. The country has a wide range of indigenous fodder plants that meets farmers' selection criteria, only that they lack the knowledge on many of them. Probably that is why they are underutilized (Kangara et al., 2008)

Resource of fodder are always in great demand world over, information is rarely taped for fodder (Ahirrao and Patil, 2003; Tayade and Patil, 2003).

## MATERIALS AND METHODS :

The present investigation was carried out during November 2013- March 2015 with regular field visits and extensive survey was carried out in the study area. Discussions with the shepherds and villagers from different localities in Gadchiroli districts were carried out. The information about the Goat fodder plants, their local names, availability, presence, palatability and its effects, etc. was gathered. A query form was prepared and a general talk was carried out with the concerned people. The form included vernacular name, the botanical name, family, habit and parts eaten by the goats. Te data collected was confirmed with the field observations to whether the information given is authentic. There were number of plants which were not reported by the informants due to unavailability of local names but those were included in list by l observations.

Photographs were taken from the field along with the provided data by the informants. Plants were identified by using various floras like Singh et. al (2000, 2001) Flora of Maharashtra, Flora of Nagpur District by Ugemuge (1986) etc.

**OBSERVATIONS :**

The habit of palatable plants is furnished in Table No. – 1. The details about the informants is given in Table No. -2. The information about the total plants observed is presented in the tabulated format and furnished in Table No. – 3. Photograph of plants as fodder and photographs of informants are given in Figure No. -1 & 2 respectively. Preferred plants parts eaten are represented in graphical form in Figure No. – 3.

**Figure 1 : Photographs of palatable plants**

**Canthium coromandelicum (N. Burm.) Alston, (Kaatbor)**

**Cordiospermum heliacacabum L. , (Fopati)**

**Ipomoea obscura (L.) Ker-Gawl. (Bhovra yel)**

**Dodonea viscosa (L.) Jacq ( Barik Lokdi)**

**Olax psittacorum (Willd.) Vahl (Haratfari)**

**Pergularia daemia (Forssk.) Choiv. (Utaran yel)**

**Ventilago Denticulata Willd. (Safed Pakadi)**

**Ziziphus oenoplia L. Mill. (Yeroni)**

**Figure 2 : Photographs of Informants**

Goats feeding at home.

Making feed available for the goats.

Tikaram Jagganath Bawane, Shivani collecting plants for his goats.

Sheikh Mohammad Sharif, Gadchiroli taking plants to home for goats.

Sandhya Dudhkawade, Gadchiroli taking her goats on feed to adjoin jungle.

Nitin Mahadeo Gurnule, Shivani bringing plants from nearby forest.

Prakash Prabhakar Kukudkar, Kharpundi showing his livestock wealth.

**Table 1 – Plants preferred by Goats as fodder.**

| S.N. | Scientific Name | Family | Vernacular Name | Habit | Parts Eaten | | |
|---|---|---|---|---|---|---|---|
| | | | | H/S/T/C | Leaf | Flower | Fruit |
| 1 | *Abrus precatorius* L. | Fabaceae | Gunj | C | Y | N | N |
| 2 | *Abutilon indicum* (Link) Sweet | Malvaceae | Shikuli | S | Y | N | N |
| 3 | *Acacia auriculiformis* A.Cunn. ex Benth. | Caesalpiniaceae | Australian babhul | T | Y | N | N |
| 4 | *Acacia catechu* (L. f.) Willd. | Mimosaceae | Khair | T | Y | N | N |
| 5 | *Acacia nilotica* (L.) Willd. | Mimosaceae | Babhul | T | Y | N | N |
| 6 | *Acacia leucophloea* (Roxb.) Willd. | Mimosoideae | Hivar | T | Y | N | N |
| 7 | *Achyranthes aspera* L. | Amaranthaceae | Kutri/ Aaghada | H | Y | N | N |
| 8 | *Aegle marmelos* (L.) Correa | Rutaceae | Bel | T | Y | N | N |
| 9 | *Ageratum conyzoides* L. | Asteraceae | Chikana | H | Y | N | N |
| 10 | *Alangium salvifolium* (L. f.) Wangerin | Alangiaceae | Aakola | T | Y | Y | Y |
| 11 | *Albizia odoratissima* (L.f.) Benth. | Mimosaceae | Chichwa | T | Y | N | N |
| 12 | *Alternanthera paronychioides* St. | Amaranthaceae | Dhor Patur | H | Y | Y | Y |
| 13 | *Alternanthera sessilis* (L.) R. Br. ex DC | Amaranthaceae | Patur | H | Y | Y | Y |
| 14 | *Alysicarpus scariosus* (Rottl. ex Spr.) Grah | Fabaceae | Gavanda | H | Y | Y | Y |
| 15 | *Alysicarpus tetragonolobus* Edgew. | Fabaceae | Chiapadi | H | Y | Y | Y |
| 16 | *Alysicarpus vaginalis* (L.) DC. | Fabaceae | Chiapadi | H | Y | Y | Y |
| 17 | *Amaranthus spinosus* L. | Amaranthaceae | Chiwar | H | Y | Y | Y |
| 18 | *Anisomeles indica* (L.) O. Ktze. | Lamiaceae | Bhutganja | S | Y | N | N |
| 19 | *Antidesma acidum* Retz. | Euphorbiaceae | Jondhurli | S | Y | Y | Y |
| 20 | *Azanza lampas* (Cav.) Alef. | Malvaceae | Ran bhendi | S | Y | N | N |
| 21 | *Bauhinia racemosa* Lam. Syn *Piliostigma racemosum* (Lam.) Benth. | Caesalpiniaceae | Aapta /Sehara | T | Y | Y | Y |
| 22 | *Bombax ceiba* L. | Bombacaceae | Katesawari | T | Y | N | N |
| 23 | *Bridelia hamiltoniana* Wall. ex Muell. | Euphorbiaceae | Kudursi | T | Y | N | N |
| 24 | *Bridelia retusa* (L.) Spreng. | Euphorbiaceae | Kasai | T | Y | N | Y |
| 25 | *Buchanania cochinchinensis* (Lour.) Almeida | Anacardiaceae | Chaar | T | Y | N | Y |

| S.N. | Scientific Name | Family | Vernacular Name | Habit | Parts Eaten | | |
|---|---|---|---|---|---|---|---|
| | | | | H/S/T/C | Leaf | Flower | Fruit |
| 26 | *Cajanus cajan* (L.) Millsp. | Fabaceae | Turi | S | Y | Y | Y |
| 27 | *Cajanus scarabaeoides* (L.) du–Petit–Thours | Fabaceae | Junglee Tur | C | Y | Y | Y |
| 28 | *Calycopteris floribunda* (Roxb.) Poir. | Combretaceae | Jilbuli/Kukudranji | C | Y | N | N |
| 29 | *Canthium coromandelicum* (N. Burm.) Alston | Rubiaceae | Kaatbor | S | Y | N | Y |
| 30 | *Capparis brevispina* DC. | Capparaceae | Varakli | C | Y | N | N |
| 31 | *Cardiospermum halicacabum* L. | Sapindaceae | Fopati | S | Y | Y | Y |
| 32 | *Careya arborea* Roxb. | Lecythidaceae | Kumbha | T | Y | N | N |
| 33 | *Cassia fistula* L. | Caesalpiniaceae | Bahava | T | Y | Y | N |
| 34 | *Cassia obtusifolia* L. Syn *Cassia tora* Sensu Baker. | Caesalpiniaceae | Tarota | H | Y | N | N |
| 35 | *Celosia argentea* L. | Amaranthaceae | Kombda/Kukurda | H | Y | N | N |
| 36 | *Ceriscoides turgida* (Roxb.) Tirveng. | Rubiaceae | Pandhra Fendra | T | Y | N | N |
| 37 | *Clitoria ternatea* L. | Fabaceae | Chipur sheng | C | Y | Y | Y |
| 38 | *Cocculus hirsutus* (L.) Theob. | Menispermaceae | Washin | C | Y | N | N |
| 39 | *Combretum albidum* G. Don | Combretaceae | Piwaryel | C | Y | N | N |
| 40 | *Crotalaria juncea* L. | Fabaceae | Boru | H | Y | N | N |
| 41 | *Crotalaria spectabilis* Roth. | Fabaceae | Boru (Sonboru) | H | Y | N | N |
| 42 | *Cuscuta reflexa* Roxb. | Cuscutaceae | Adharyel | C | Y | Y | Y |
| 43 | *Cynodon dactylon* (L.) Pers. | Poaceae | Dubari / Durva | H | Y | Y | Y |
| 44 | *Dalbergia sissoo* Roxb. | Fabaceae | Shisham | T | Y | N | N |
| 45 | *Dendrocalamus strictus* (Roxb.) Nees | Poaceae | Ranji | S | Y | N | N |
| 46 | *Dodonea viscosa* (L.) Jacq | Sapindaceae | Barik Lokdi | S | Y | Y | Y |
| 47 | *Dolichandrone falcata* (Wall. ex DC.) Seem. | Bignoniaceae | Medshingi | T | Y | N | N |
| 48 | *Emblica officinalis* Gaertn. | Euphorbiaceae | Aavala | T | Y | Y | Y |
| 49 | *Ficus amplissima* J.E. Sm. | Moraceae | Pakadi | T | Y | N | N |
| 50 | *Ficus hispida* L.f. | Moraceae | Kaat Umbri | T | Y | N | N |

| S.N. | Scientific Name | Family | Vernacular Name | Habit | Parts Eaten | | |
|---|---|---|---|---|---|---|---|
| | | | | H/S/T/C | Leaf | Flower | Fruit |
| 51 | *Ficus racemosa* L. | Moraceae | Umbar | T | Y | Y | Y |
| 52 | *Ficus religiosa* L. | Moraceae | Pimpal | T | Y | N | N |
| 53 | *Gardenia resinifera* Roth. | Rubiaceae | Dikemaali | T | Y | N | Y |
| 54 | *Gmelina arborea* Roxb. | Lamiaceae | Shivan | T | Y | N | N |
| 55 | *Grangea maderaspatana* (L.) Poir. | Asteraceae | | H | Y | N | N |
| 56 | *Grewia asiatica* L. | Tiliaceae | Falsa | S | Y | Y | Y |
| 57 | *Helicteres isora* L. | Sterculiaceae | Aatai/ Muradsheng | S | Y | N | N |
| 58 | *Hemidesmus indicus* (L.) Schult. | Periplocaeae | Khobaryel | C | Y | N | N |
| 59 | *Hibiscus panduraeformis* Burm. | Malvaceae | Ran bhendi (Pivla ful) | H | Y | N | N |
| 60 | *Hibiscus rosa-sinensis* L. | Malvaceae | Jaswand | S | Y | Y | N |
| 61 | *Hibiscus sabdariffa* L. | Malvaceae | Ambadi | H | Y | N | Y |
| 62 | *Hygrophila schulli* (Buch.–Ham.) M.R. & S.M. Almeida | Acanthaceae | Korti | H | Y | N | N |
| 63 | *Ipomoea nil* (L.) Roth | Convolvulaceae | Krishna pandav | C | Y | N | N |
| 64 | *Ipomoea obscura* (L.) Ker-Gawl. | Convolvulaceae | Bhovra yel | C | Y | N | N |
| 65 | *Ixora arborea* Roxb. ex J. E. Sm. | Rubiaceae | Lokdi | S | Y | N | N |
| 66 | *Lablab purpureus* (L.) Sweet | Fabaceae | Vaal | C | Y | Y | Y |
| 67 | *Lagerstroemia parviflora* Roxb. | Lythraceae | Sehana | T | Y | N | N |
| 68 | *Lannea coromandelica* (Houtt.) Merr. | Anacardiaceae | Movai/ Moin | T | Y | N | N |
| 69 | *Lantana camara* L. | Verbenaceae | Madhumalti | T | Y | N | N |
| 70 | *Leucaena latisiliqua* (L.) Gillis | Mimosaceae | Subabhul | T | Y | N | N |
| 71 | *Lindernia ciliata* (Colsm.) Penn. | Scrophulariaceae | | H | Y | Y | Y |
| 72 | *Lindernia crustacea* (L.) F. Muell. | Scrophulariaceae | | H | Y | Y | Y |
| 73 | *Lindernia viscosa* (Horhem.) Boldingh | Scrophulariaceae | | H | Y | Y | Y |
| 74 | *Madhuca longifolia* (Koen.) Mac Bride | Sapotaceae | Moha | T | Y | Y | Y |
| 75 | *Malachra capitata* (L.) L. | Malvaceae | Ran Bhendi | S | Y | N | N |

| S.N. | Scientific Name | Family | Vernacular Name | Habit | Parts Eaten | | |
|---|---|---|---|---|---|---|---|
| | | | | H/S/T/C | Leaf | Flower | Fruit |
| 76 | *Mangifera indica* L. | Anacardiaceae | Aamba | T | Y | N | Y |
| 77 | *Maytenus senegalensis* (Lam.) Excell. | Celastraceae | Bharkad | S | Y | Y | Y |
| 78 | *Merremia hederacea* (Burm. f.) Hall. | Convolvulaceae | Divati | C | Y | N | Y |
| 79 | *Mimosa hamata* Willd. | Mimosaceae | Chialati | S | Y | N | N |
| 80 | *Morus alba* L. | Moraceae | Malvari | T | Y | Y | Y |
| 81 | *Mucuna pruriens* (L.) DC. | Fabaceae | Kavaskuri | C | Y | N | N |
| 82 | *Neptunia sp.* | Fabaceae | Dhendari | S | Y | Y | Y |
| 83 | *Olax psittacorum* (Willd.) Vahl | Olacaceae | HaratFari | C | Y | Y | Y |
| 84 | *Operculina turpethum* (L.) S. Manso | Convolvulaceae | Gahuyel/ Bokadyel | C | Y | N | N |
| 85 | *Ougeinia oojeinensis* (Roxb.) Hochr | Fabaceae | Tiwas | T | Y | N | N |
| 86 | *Peltophorum pterocarpum* (DC.) K. Heyne | Caesalpiniaceae | | T | Y | N | N |
| 87 | *Pergularia daemia* (Forssk.) Choiv. | Asclepiadaceae | Utaran | C | Y | N | N |
| 88 | *Peristrophe paniculata* (Forssk.) Brummitt | Acanthaceae | | H | Y | N | N |
| 89 | *Phyllanthus amarus* Schum & Thonn. | Euphorbiaceae | Bhuiavali | H | Y | Y | Y |
| 90 | *Phyllanthus fraternus* Webster | Euphorbiaceae | Bhuiawala | H | Y | Y | Y |
| 91 | *Phyllanthus reticulatus* Poir. | Euphorbiaceae | Pitondi /Pipondi | S | Y | N | N |
| 92 | Phyllanthus virgatus Forst. | Euphorbiaceae | Bhuiawala | H | Y | Y | Y |
| 93 | *Pithecellobium dulce* (Roxb.) Benth | Mimosaceae | Chichbilai/ Ingraji Chinch | T | Y | N | N |
| 94 | *Pongamia pinnata* (L.) Pierre | Fabaceae | Karanj | T | N | Y | N |
| 95 | *Pterocarpus marsupium* Roxb. | Caesalpiniaceae | Bija/Biwala | T | Y | N | N |
| 96 | *Quirivelia frutescens* (L.) M.R. & S.M. Almeida | Apocynaceae | Mogaryel | C | Y | N | N |
| 97 | *Sida acuta Burm* F. | Malvaceae | Kharata | H | Y | N | N |
| 98 | *Sida cordifolia* L. | Malvaceae | | H | Y | N | N |
| 99 | *Sida rhombifolia* L. | Malvaceae | | H | Y | N | N |
| 100 | *Smilax zeylanica* L. | Smilacaceae | Sher dire | C | Y | Y | Y |

| S.N. | Scientific Name | Family | Vernacular Name | Habit | Parts Eaten | | |
|---|---|---|---|---|---|---|---|
| | | | | H/S/T/C | Leaf | Flower | Fruit |
| 101 | *Solanum nigrum* L. | Solanaceae | Kamoni | S | Y | N | Y |
| 102 | *Solanum virginianum L.* | Solanaceae | Dorli | H | Y | N | Y |
| 103 | *Soymida febrifuga* (Roxb.) Juss. | Meliaceae | Rohan | T | Y | N | Y |
| 104 | *Sphaeranthus indicus* L. | Asteraceae | Godri/ Gorakhmundi | H | Y | Y | Y |
| 105 | *Streblus asper* Lour. | Moraceae | Kharasli | T | Y | N | N |
| 106 | *Tamarindus indica* L. | Caesalpiniaceae | Chinch | T | Y | Y | N |
| 107 | *Tamilnadia uliginosa* (Retz.) | Rubiaceae | Kala fendra | T | Y | N | Y |
| 108 | *Teramnus labialis* (L. f.) Spreng. | Fabaceae | Lambi Chipadi/ Ran Udid | C | Y | N | N |
| 109 | *Terminalia arjuna* (Roxb.) Wight & Arn. | Combretaceae | Arjun | T | Y | N | N |
| 110 | *Terminalia bellirica* (Gaertn.) Roxb. | Combretaceae | Beheda | T | Y | Y | Y |
| 111 | *Terminalia chebula* Retz. | Combretaceae | Hirda | T | Y | N | Y |
| 112 | *Terminalia elliptica* Willd. | Combretaceae | Ain | T | Y | N | N |
| 113 | *Tinospora cordifolia* (Thunb.) Miers | Menispermaceae | Guryel | C | Y | N | N |
| 114 | *Triumfetta rhomboidea* Jacq. | Malvaceae | | H | Y | N | N |
| 115 | *Urena lobata* L. | Malvaceae | Barik lenduli | S | Y | Y | N |
| 116 | *Ventilago Denticulata* Willd. | Rhamnaceae | Safed Papadi | C | Y | N | N |
| 117 | *Ventilago maderaspatana* Gaertn | Rhamnaceae | Lal Papadi | C | Y | N | N |
| 118 | *Vitex negundo* L. | Lamiaceae | Nirgundi | S | Y | N | N |
| 119 | *Wattakaka volubilis* (L. f.) Stapf | Asclepiadaceae | Ekdodi | C | Y | N | N |
| 120 | *Xanthium strumarium* L. | Asteraceae | Lenduli/ Lendukali | H | Y | N | N |
| 121 | *Ziziphus jujuba* Mill. | Rhamnaceae | Bor (Zad) | T | Y | Y | Y |
| 122 | *Ziziphus nummularia* (Burm. f.) Wight & Arn. | Rhamnaceae | Bor (Zudup) | S | Y | Y | Y |
| 123 | *Ziziphus oenoplia* L. Mill. | Rhamnaceae | Yeroni / Mokai | C | Y | Y | Y |
| 124 | *Ziziphus xylopyrus* (Retz.) Willd. | Rhamnaceae | Ghatbor, Goti | T | Y | N | N |

**Figure 3 – Graph showing plants parts preferred by Goats**

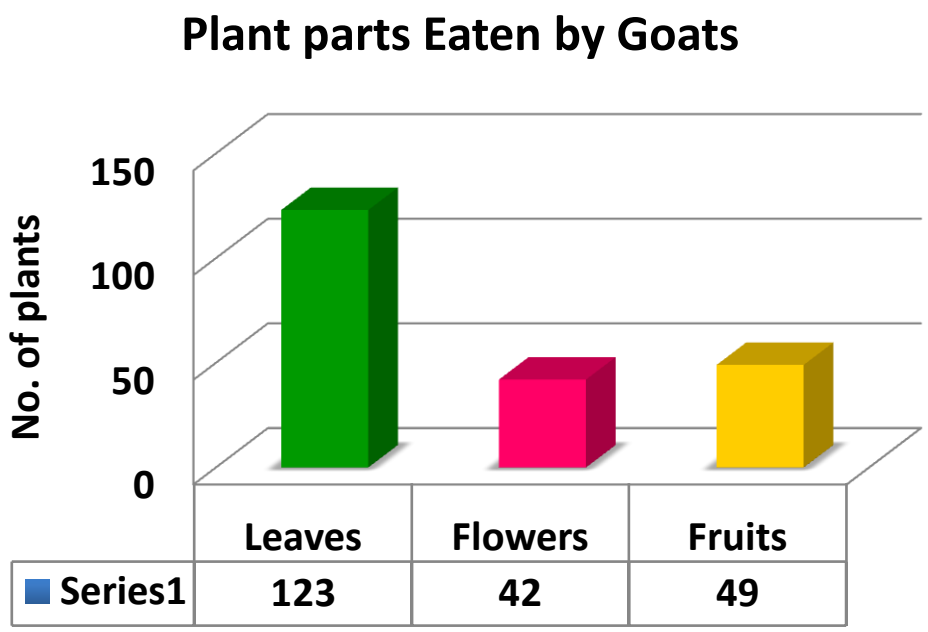


**Table 1 - Habits of the palatable plants**

| Habit | Number of Plants |
|---|---|
| Herbs | 31 |
| Shrubs | 22 |
| Trees | 46 |
| Climbers | 25 |
| **Total** | **124** |

**Table 2 -Category wise analysis of total Informnats**

| Category | No. of Informants |
|---|---|
| GEN | 4 |
| OBC | 62 |
| SBC | 23 |
| SC | 11 |
| ST | 57 |
| NT | 43 |
| **Total** | **200** |

## DISCUSSION AND CONCLUSIONS :

Out of thousands of surrounding plants only few plants are eaten by the goat and during the present investigation total 124 plant taxa were recorded. The 124 taxa are distributed in 40 families and dominant families are Fabaceae (16) and Malavaceae (11). Habit wise studied taxa were differentiated as 31 - Herbs, 22 - Shrubs, 46 - Trees, 25 - Climbers. Leaves of 123 plans are commonly eaten. Flowers of 42 plants are eaten. Fruits of only 49 plants are eaten. Roots are prefrably not eaten being underground and their natural instict is not to dig but just to pick up and forward. Though the surrounding vegetation is dominated by various plants like *Tectona grandis* and *Butea monosperma* but gaots do not feed on them. Only in certain cases they just eat the young shoots. Grasses are least preferd by the goats.

Majority OBC (31%), ST (29%) and NT (22%) categorized people are involved in the goat cultivation / farming business. The least percentage is of general categorized people. Goats provide important way of economy to the families residing in the rural as well as urban areas. Where as during the survey it is observed that number of families are having goat farming as their main business since last few years and are very satisfied.

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